THE IRON TRADE REVIEW

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THE WEEK IN IRON CIRCLES.

THE MARKET AT LARGE.

The purchase of 200,000 tons of steel billets by the Pittsburg Steel Co. from the United States Steel Corporation and the Republic Iron & Steel Co., deliveries extending to the middle of 1906, is the event of the week. A conversion deal involving the purchase of 100,000 tons of Bessemer pig iron from merchant furnaces was under consideration by the same company, but this plan was given up and the large contract for steel is the outcome. About 10,000 tons of basic billets and 6,000 tons of Bessemer billets a month will be delivered, the basic steel being furnished by the Steel Corporation. The announced price is $23, Pittsburg, which would indicate an entirely favorable view of steel market prospects for the coming year. The fact that there was little contest for this business contrasts sharply with the circumstances attending the placing of the same company's contract in the summer of 1904. Steel companies seem so certain of needing the entire output of their Bessemer and open-hearth departments for their finishing mills, apart from the ordinary run of billet business, that large contracts in the latter are not sought.

Merchant furnaces have made further pig iron sales to steel companies in the week. Out of 40,000 tons of Bessemer and basic iron sold at $15.50 at Valley furnace, a Western Pennsylvania steel company took 25,000 tons. A Youngstown interest has bought 25,000 tons of Bessemer iron that will be converted and rolled into skelp for it at Valley steel works. On behalf of the National Tube Co. an inquiry for Bessemer iron is now up. Though the 100,000-ton purchase for conversion was not made, as talked of one week ago, the Mahoning and Shenango Valley merchant furnaces are sold quite well into the second quarter, and beyond expected needs of the Steel Corporation will have little iron for the market prior to the middle of the year. The operation of close to 97 percent of the Steel Corporation's furnaces means that idle capacity for relining and repairs will be greater at no distant day.

The foundry pig iron market has not been particularly interesting in the week, though buying for the first half of the year still goes on. Sales for third quarter are more numerous, and some furnaces are sold well into the summer. Little has come from the talk of advances in Southern iron. The market is still $13.50 for No. 2, as it has been for weeks, though one leading company has put its quotation at $13.75 for further forward deliveries. Eastern Pennsylvania furnaces have sold rather freely since the beginning of the month and have made an advance of 25 cents a ton. In the Buffalo district sellers of foundry iron have put up prices from 50 cents to $1 a ton under good sales in the past ten days. The feeling in the foundry iron trade is that with the large current melt of iron on railroad, pipe, stove and agricultural works accounts, the addition of the needs of jobbing and machinery foundries, now more of a factor in the market, will presently make full deliveries of foundry iron more difficult. Yet production of pig iron is proceeding at an unprecedented rate, and March is expected to make a record.

The finished material markets are dominated by conditions that ordinarily arise considerably later in the season—mills unable to make contract deliveries. Yet business in the lines in which congestion is most apparent, is going steadily on the books of the mills, with the practical certainty that delays in shipments will be more pronounced with each week. The rail total for 1905 is now reported at close to 1,500,000 tons. Sales made in the week aggregated about 75,000 tons. One trunk line took 25,000 tons additional and another 10,000 tons additional. The Western Maryland took 6,000 tons, two trolley roads 5,000 each and other trolley roads the remainder.

Plate and structural lines, two others in which tonnage runs up rapidly, make a stronger showing with each week. Plate mills are two to three months behind, and boiler works are now reinforcing the steel car works in the urgency of their demand. Eastern business in structural steel is coming out well, barring the holding up of some work in New York. A Boston bridge company booked 2,500 to 3,000 tons for Boston & Albany work; the Erie system bought 4,000 tons, and for new industrial works 3,500 tons was closed. Railroad bridge work under inquiry represents 15,000 to 20,000 tons. Cleveland railroads have definitely decided on a program of track elevation and depression.

The expected advances in black and blue annealed sheets and in roofing were made last week, and steel hoops are $2 a ton higher. Eastern bar iron manufacturers reaffirmed the 1.50c Pittsburg basis but are getting $2 a ton higher. Bolts and nuts were advanced 2½ percent, but association action is no longer in force.

PITTSBURG.

(Special Telegram.)

PITTSBURG, March 22.—The Youngstown Iron Sheet & Tube Co. has purchased 25,000 tons of Bessemer pig iron for last half delivery at $15.50 at furnace from a furnace outside of the Bessemer Furnace Association. The iron will be used on a conversion arrangement with the Republic Iron & Steel Co. The National Tube Co. is in the market for a small tonnage of Bessemer iron.

OFFICE OF *The Iron Trade Review*,
429 PARK BUILDING, March 22.

The purchase of 200,000 tons of Bessemer and open-hearth billets by the Pittsburg Steel Co. is by far the most important transaction of the week's iron and steel trade in this district. The steel is for delivery during the twelve months beginning July 1, this year, and the contract calls for the delivery of approximately 10,000 tons of open-hearth and 6,000 tons of Bessemer billets per month. The contract for the open-hearth billets was awarded the Carnegie Steel Co., and the Republic Iron & Steel Co. will furnish the Bessemer billets. When the negotiations for the purchase of the 1905-6 requirements of this company were opened, the Bessemer Furnace Association was asked to quote a price on 100,000 tons of Bessemer iron to be used in arranging a conversion deal on about half of the tonnage. With the present price of Bes-

semer iron, and the conversion cost on the higher basis of today, it was found difficult to get any steel company to convert pig iron at a price offering any advantage over an outright purchase of steel. It is reported from an official source that the open-hearth billets were sold on the basis of $23 f. o. b. mill, which is $2 a ton above the present association price, and from $1 to $2 a ton below the price asked for spot steel. But whether there are other stipulations modifying this price can not be learned. These billets will in all probability be rolled at the Donora plant of the Carnegie Steel Co., from which the freight to Monessen is only 15 cents. The price paid for the Bessemer billets is reported at $23, Pittsburg, which would net the Republic Iron & Steel Co. $1.05 above the association price. While the bulk of this steel will be used in the wire, nail and hoop mills of the Pittsburg Steel Co., a small portion will be used in the tube plant of one of its allied companies.

At the present time the Pittsburg Steel Co. is securing its steel from the Republic Iron & Steel Co. and the LaBelle Iron Works. These contracts were entered into last July, the steel being made on a conversion arrangement. The steel was for delivery extending over a period of eleven months beginning with August, 1904. On this contract the Republic Iron & Steel Co. is delivering 10,000 tons of Bessemer billets a month and the LaBelle Iron Works about 3,000 tons of open-hearth. The Pittsburg Steel Co. at that time purchased 110,000 tons of Bessemer iron to apply on this contract at $13, furnace, and with a low conversion price, the cost of the steel was a trifle below $20 a ton, delivered. As the association price on billets at that time was $23, the closing of the contract on this basis threatened the disruption of the billet association. The advancing market, however, closed the breach that existed between the leading steel interests and with the press of business the matter was soon forgotten. In the summer of 1903 the placing of this contract also threatened the disruption of the billet association, the Clairton Steel Co. at that time demanding its share of the tonnage. The Republic Iron & Steel Co.'s share of the tonnage on the new contract is satisfactory to the officials of that company, as it will be unable to sell as much steel in the open market after July as heretofore, on account of the operation of its new sheet bar and rail mill. The LaBelle Iron Works will also consume a larger proportion of its own steel after the middle of the year when its new plate mill will be completed. It is understood that the Pittsburg Steel Co. is guaranteed against any decline during the year the contract has to run.

While some of the furnaces of the Bessemer Association were disappointed in not having the contract go through on a conversion basis, the sales of both Bessemer and basic during the week have been entirely satisfactory, and most of the Valley furnaces have their output well taken care of through the first half, with allowances for the future purchases to be made by the Steel Corporation. Sales of pig iron during the week aggregate 40,000 tons, of which the Cambria Steel Co. purchased 25,000 for delivery during the second quarter. On this contract both Besesmer and basic iron will be applied, and on all sales $15.50 at furnace was the price for both classes.

In finished lines advances of $2 a ton were made last Thursday on black sheets and $1 on blue annealed, and painted corrugated roofing was advanced 10 cents a square. On Monday, March 20, the steel hoop mills advanced prices $2 a ton, this having been decided upon at a meeting held on Saturday. Foreign producers of ferro-manganese have also made stiff advances in prices, some of the largest producers now quoting $49.50, Pittsburg, in carload lots. The domestic output is entirely sold up and higher prices than those quoted are looked for from the foreign makers.

The announcement of the improvement program of the United States Steel Corporation is awaited with much interest. The appointment of John Reis at the head of the construction department was in view of the tremendous increase planned in both iron and steel producing capacity. The bulk of the expenditure will be made in this district, new blast furnaces being projected for Duquesne, where it is probable that four will be erected, besides two at Donora and one at Mingo Junction, O.

Pig Iron.—Sales aggregating 40,000 tons of Bessemer and basic iron during the past week have been made for second quarter delivery, on the basis of $15.50, furnace. The Cambria Steel Co. took 25,000 tons, and the remaining tonnage was scattered among smaller consumers. The United States Steel Corporation is expected to purchase 40,000 tons of Bessemer for April delivery within a few days, and with this purchase, the bulk of the steel making iron from the merchant furnaces for the second quarter will have been disposed of. Prices on foundry iron are somewhat stronger, and while $16 at the furnace can be shaded, the majority of the operators are adhering to this price and a few are asking an advance of 25 to 50 cents a ton. Forge iron is weak; while $15.85 is asked, it is probable that $15.75, Pittsburg, could be done. We revise quotations as follows:

Bessemer, Valley	$15 50
Bessemer, Pittsburg	16 35
No. 1 Foundry	$17 00 to 17 25
No. 2 Foundry	16 75 to 17 35
Gray forge, Pittsburg	15 75 to 15 85
Basic, Valley	15 40 to 15 50
Basic, Pittsburg	16 25 to 16 35

Steel.—The placing of the contract of the Pittsburg Steel Co. at this time would indicate that the officials of that company are convinced that increased premiums on steel will be asked before summer. The fact that the bulk of the tonnage is open-hearth steel instead of Bessemer is also interesting, the company desiring open-hearth in preference to Bessemer for most of its work. That there was no scramble for this business also indicates the general strength of the steel situation. With the possible exception of the Jones & Laughlin Steel Co., the independent steel producers are adding finishing capacity which will curtail their open market sales, and the additional Talbot furnaces that are being built by the Jones & Laughlin Steel Co. will only provide against the steel shortage which all the company's mills are experiencing. For prompt delivery, Bessemer and open-hearth billets are quoted at $24.50 to $25, Pittsburg, and sheet bars at $26 to $26.50. Bessemer and open-hearth rods are quoted at $34 to $35.

Ferro-Manganese.—With domestic ferro off the market, the foreign producers are controlling the situation and prices have already been advanced to $49.50, Pittsburg, for 80 per cent, by most of the producers. A week ago $44.50, Pittsburg, was quoted.

Muck Bar.—With forge iron easier, muck bar is somewhat lower, and we quote neutral bars at $28.35, Pittsburg, in carload lots.

Skelp.—A fair demand continues for both iron and steel skelp, but most of the mills are operating on long time contracts and shipments on material are being hurried forward. Iron skelp, grooved is held at 1.65c to 1.70c, and sheared at 1.80c to 1.85c. Steel grooved is quoted at 1.50c to 1.55c, and sheared at 1.60c.

Rails and Track Material.—The total rail tonnage now on the books of the leading mills aggregate close to 1,500,000 tons. While most of the large trunk lines have already placed their requirements, the orders from smaller roads are numerous and the inquiry from electric lines is heavy, indicating a revival in this line of work. We make the following quotations: Fifty lb. and over 500 tons, $28; car lots and less than 500 tons, $30; less than car lots, $32; light rails, 16 lb., $26 to $26.50; 20 lb., $25 to $25.50; 25 to 45 lb., $23 to $23.50; Angle bars for standard sections, 1.25c; spikes, 1.75c to 1.80c.

Plates.—All of the mills are behind on deliveries of open-hearth plates on account of the heavy requirements of the steel car plants. Boiler makers are also beginning to specify heavily and on most sizes of plates deliveries cannot be prom-

ised in less than two to three months. We quote as follows: Tank plates, 1¼ in. thick, 6¼ in. to 14 in., inclusive, 1.50c f. o. b. mill Pittsburg; over 14 in. up to 100 in., 1.60c. Extras are as follows per lb.: Flange and boiler steel, 10c; marine, A. B. M. A., and ordinary fire box, 20c; still bottom, 30c; locomotive firebox, 50c; plates over 100 in. up 110 in. in width, not less than 5c per 100 lb. extra; plates 110 in. to 115 in. wide, not less than 10c extra; 115 to 120 in., 15c extra; plates 120 in. to 125 in. wide, not less than 25c extra; plates 125 in. to 130 in., not less than 50c extra; plates 130 in. wide, not less than $1 extra; plates 3-16 in. thick, $2 extra; gauges 7 and 8, $3 extra; No. 9, $5 extra. Five cents extra for less than carloads. Terms net cash in 30 days, and for all points of delivery in the United States except Pacific Coast.

Structural Material.—The contract for 3,000 tons of structural material for a bridge over the Connecticut River has been placed with one of the local steel mills. All the mills are behind on deliveries on all shapes entering into steel car construction and the demand for light angles is especially heavy. We quote as follows: Beams and channels up to 15 in., 1.60c; over 15 in., 1.70c; angles 3 x 2 up to 6 x 6, 1.60c; zees, 1.50c; tees, 1.65c; angles from 3 to 16 in., 1.60c; universal and sheared plates, 6¼ to 14 in., inclusive, 1.50c; over 14 in., 1.60c base.

Bars.—At a meeting of the steel hoop manufacturers held in this city Saturday, it was decided to advance prices on Monday, March 20, $2 a ton. Since the last advance on steel bars, hoops have been on too low a basis and the advance only restores the proper differential. We revise quotations as follows: Bar iron, 1.65c to 1.69¼c Pittsburg; hoops, 1.65c, and bands, 1.50c, both taking bar extras. Bessemer steel bars, 1.50c; open-hearth steel bar, 1.50c; plow and cultivator, 1.50c, net; channels, angles, zees and tees, under 3 in., 1.65c. The following differentials are maintained on steel: Less than 2,000 lb. of a size and not less than 1,000 lb., 10 cents advance; less than 1,000 lb. of a size, 30 cents advance.

Sheets.—The anticipated advance on sheets went into effect on Thursday, March 16. Black sheets were advanced $2, and Wood's refined sheets, not planished, were also advanced from 2.60c to 2.70c. On blue annealed sheets an advance of $1 a ton was made, while painted corrugated roofing was advanced 10 cents a square to $1.75. On February 9 galvanized sheets were advanced $2 and blue annealed $1. Demand for sheets is heavy, all of the mills of the American Sheet & Tin Plate Co. being in operation at present. We revise quotations as follows: Block sheets, carloads, No. 30, 2.80c; No. 29, 2.70c; No. 28, 2.40c; No. 27, 2.30c; Nos. 25-26, 2.25c; Nos. 23-24, 2.20c; No. 18-20, 2.15c; No. 16, 2.10c; Nos. 12-14, 2.05c; No. 9, 2c; No. 8, 1.95c. Galvanized, No. 30, 4.35c; No. 29, 3.85c; No. 28, 3.45c; No. 27, 3.25c; Nos. 25-26, 3.05c; Nos. 23-24, 2.85c; Nos. 18-20, 2.70c; No. 16, 2.55c.

Wire and Wire Nails.—The movement of nails and wire products is not quite so heavy as expected and jobbers are still carrying enormous stocks. New business with local mills is not very heavy, but as soon as the stocks begin to move, with the advent of milder weather a better demand is expected. We make the following quotations: Wire nails, jobbers' carload lots, $1.80; retailers' carload lots, $1.85, and less than carloads, $1.95; painted barb wire, $1.95 for jobbers in carloads; retailers' carloads, $2 and less than carloads, $2.10, with 30 cents for galvanizing. Annealed smooth fence wire is held at $1.65, with the usual differentials to retailers for carloads and less than carloads. Quotations are all f. o. b. Pittsburg, 60 days, with 2 percent discount for cash in ten days. Iron cut nails are held at $1.85 Pittsburg, and steel at $1.75.

Merchant Steel.—The local mills continue to enjoy a very heavy demand for all classes of high grade steel and the shafting manufacturers also report big shipments. We quote as follows: Cold rolled and ground shafting, 50 percent off in carload lots, and 45 off in less than car lots, delivered in base territory; tire steel, 1.60c to 1.65c; open-hearth spring steel, 2c to 2.10c; sleigh shoe flat, 1.55c to 1.60c; smooth finished machinery steel, 1.60c; toe calk, 1.05 to 2c.

Old Material.—The old material market continues quiet, few of the large steel mills buying in quantities at the prices the dealers are asking. The movement of small lots of heavy melting stock is large, inasmuch as lower prices can be obtained on small lots than large quantities. We make the following quotations, gross tons: Heavy melting stock, $16 to $16.50; low phosphorus, $19.50 to $20.50; rerolling rails, $16 to $16.50; sheet scrap, $14 to $14.25; No. 1 wrought, $19 to $19.50; cast iron borings, $11 to $11.25.

Coke.—During the week ending March 11, the shipment of coke from the Connellsville region was the heaviest in the history of that coke producing district. During this week 14,456 cars were shipped, as follows: To Pittsburg, 4,852 cars; points west of Pittsburg, 8,101 cars and to points east of Connellsville 1,503 cars. The total production of the week aggregated over 330,000 tons, the upper region producing 255,388 tons and the lower region 74,699 tons. Out of a total of 29,195 ovens in the whole region only 1,416 were idle. This is the smallest percentage of idle ovens in the entire history of the region. Furnace coke for the second half is selling at $2.45 to $2.50 and foundry for immediate delivery is held at $3 to $3.25.

Pipes and Tubes.—The demand for boiler tubing is much stronger than it has been in the past two years, while the demand for merchant pipe continues exceedingly heavy. Discounts to consumers, carload lots, f. o. b. Pittsburg, plus freight to destination according to Tube Rate Book, are as follows:

MERCHANT PIPE.

	Steel.		Iron.	
	Black.	Galv.	Black.	Galv.
⅛ and ¼ inch	67½	51½	65½	49½
⅜ to 6 inches	70½	65½	74	64
⅛ and ½ inch	71½	59½	69½	57½
7 to 12 inches	70½	55½	68	53½
Extra Strong Plain Ends.				
⅛ to ¾ inch	60½	43½	58½	46½
½ to 4 inches	67½	55½	65½	53½
4½ to 8 inches	63½	51½	61½	49½
Double extra strong plain ends, ½ to 8 inches	57	46	55	44

MERCHANT BOILER TUBES, CARLOADS, 22 FEET AND UNDER.

	Steel.	Iron.
1 to 1½ inches	46	43
1¾ to 2½ inches	58	43
2½ inches	60	48
2¾ to 5 inches	66	55
6 to 13 inches	58	43

Less than carloads 2 points less.

CHICAGO.

OFFICE OF *The Iron Trade Review*,
1164 MONADNOCK BLOCK, March 21.

There seems to be no let-up to the demand for iron and steel. From all sources and for all kinds of material, specifications and orders are being received in increasing volume. Mills are operating to the limit in output, yet cannot keep pace with the demands of customers. This is particularly true with regard to steel bars, plates, structural steel and heavy rails. Inquiries for the latter received by the Western producer are now turned over to the Eastern mills of the Corporation for delivery, which is tantamount to an advance in price to consumers in this territory, since rails are sold f. o. b. mill, with full freight to point of destination added. The shortage of open-hearth steel in the West becomes more pronounced, and deliveries cannot now be given on either billets or sheet bars within six months. The Milwaukee plant of the Illinois Steel Co. has been running light because of the scarcity of billets, and the company is again a buyer of billets in the open market, having bid on several lots in the past week. As was generally expected, the leading producer advanced box annealed sheets $2 a ton and blue annealed $1 a ton last week, which equalizes black sheets with the advance made in galvanized on Feb. 9. Wood's refined unplanished sheets were also put up $2 a ton; and painted corrugated roofing was advanced

10 cents a square. Hoops were advanced $2 a ton last week, bringing this product more in line with the new prices on steel bars and bands. The one material that does not seem to share in the prosperity prevailing is bar iron. The demand is light and prices are unsteady. As low as 1.55c Chicago can be done on desirable business, though the market is generally represented at 1.60c. There has been heavy buying of cast iron pipe in the week under review, one contract for 12,000 tons having been taken by the leading maker. Trading in wire is active, specifications for farming material being especially heavy. Good reports are made with regard to merchant pipe and boiler tubes, light rails and track supplies, etc., all of which are enjoying a better demand than has been seen this year.

Pig Iron.—The principal development of the week is the willingness of a number of Southern furnaces to sell for any delivery this year on the basis of $13.50 Birmingham. This announcement is not so much of a surprise in the lengthening of deliveries, as it is at the price which is named. Heretofore, when propositions for long deliveries have been considered, premiums have been asked and secured, and are still being obtained by several of the leading producers. This particular offer, however, is not as significant as appears on the surface, as it is made by interests with only a small output to sell which they will soon dispose of. The market is strong at $13.50 for second and third quarter deliveries, and $13.75 and $14 for the last quarter. The Sloss-Sheffield Steel & Iron Co. advanced its prices last week 50 cents a ton on No. 1 and 25 cents a ton on No. 2 and lesser grades, which brings it closer in line with the Tennessee and Republic companies, both of which have been asking $13.75 for No. 2. The demand for Northern iron equals in tonnage that for Southern brands, and several yearly contracts of large proportions have been closed up in the week under review. While the buying is confined largely to coke irons, there has been good demand for charcoal and malleable. Some inquiry has also developed for basic iron, in one case bids being asked on 2,000 tons for immediate shipment. We quote as follows:

Lake Superior Charcoal	$18 50 to 19 00
Northern Foundry No. 1	18 00
Northern Foundry No. 2	17 50
Northern Foundry No. 3	17 00
Northern Scotch Foundry	18 50
Ohio Strong Softeners No. 1	19 30 to 19 80
Ohio Strong Softeners No. 2	18 30 to 18 80
Southern Foundry No. 1	17 65 to 18 15
Southern Foundry No. 2	17 15 to 17 65
Southern Foundry No. 3	16 65 to 17 15
Southern Foundry No. 4	16 40 to 16 90
Southern No. 1 Soft	17 65 to 18 15
Southern No. 2 Soft	17 15 to 17 90
Southern Gray Forge	16 40
Southern Mottled	16 40
Southern Silveries (4% to 6% Silicon)	18 65 to 19 15
Jackson Co. Silveries (6% to 8% Silicon)	21 30 to 22 30
Jackson Co. Silveries (8% to 10% Silicon)	22 30 to 23 30
Alabama and Georgia Car Wheel	21 15
Malleable Bessemer	17 50
Basic Iron	17 65 to 18 15

Billets.—The Illinois Steel Co. is reported to have purchased another lot of open-hearth billets in the past week. The company is oversold on this product, and its Milwaukee plant is suffering because of the shortage. Aside from this transaction, trading in billets in this market is limited to small lots of forging steel. Deliveries on sheet bars cannot be given within six months and no demand is noted in this market. Some inquiry has been received for wire rods, but the Western interest is pursuing a very conservative policy in selling ahead. We quote forging billets, 4 x 4 and larger, up to but not including 10 x 10, up to .25 carbon, $28; up to but not including .60 carbon, $1 extra. Rerolling billets, Bessemer or open-hearth, 4 x 4 and larger, $26 and upwards; billets, 3⅞ in. and smaller and sheet and tin bars, $27 and upwards; according to tonnage and delivery. Wire rods $35 Pittsburg.

Bars.—Demand for bar iron continues light and some trading is said to have been done on the basis of 1.55c. The market generally is quoted at 1.60c. Specifications for steel shapes are very heavy, taxing the capacity of mills to supply. Hoops have been advanced in the past week $2 a ton, making the local price, 1.81½c base, full extras. We quote carload lots, mill shipments, Chicago delivery: Bessemer and open-hearth bars and bands, 1.66½c base, half extras; soft steel angles, less than 3 x 3, 1.76½c; hard steel angles, rolled from old rails, 1.60c to 1.65c. There is a brisk demand from warehouse stocks, and store quotations are very firm. We quote bar iron 1.90c to 2c base, full extras; soft steel bars and bands, 1.85c to 1.95c base, full extras; soft steel angles, channels and tees, 1.95c to 2.05c; hoops, 2.10c base, full extras.

Sheets.—The advance announced Thursday, March 16, by the American Sheet & Tin Plate Co. of $2 a ton in box annealed and $1 a ton in blue annealed sheets, has been well received by the trade, and has been followed by similar advances on the part of independent producers. Wood's refined sheets, not planished, were also advanced $2 a ton, or to the basis of $2.70 Pittsburg for No. 28 gauge. Painted corrugated roofing was put up 10 cents a square, being now quoted $1.75 a square Pittsburg. We have revised our prices, and quote Chicago delivery, mill shipments, carload lots, as follows: Blue annealed sheets—Nos. 9 and 10, 1.86½c to 1.91½c; Nos. 11 and 12, 1.91½c to 1.96½c; Nos. 13 and 14, 1.96½c to 2.01½c; Nos. 15 and 16, 2.06½c to 2.11½c. On box annealed, one pass, cold rolled, we quote Nos. 18 and 20, 2.31½c to 2.36½c; Nos. 22 and 24, 2.36½c to 2.41½c; Nos. 25 and 26, 2.41½c to 2.46½c; Nos. 27, 2.46½c to 2.51½c; No. 28, 2.56½c to 2.61½c; No. 29, 2.66½c to 2.71½c; No. 30, 2.76½c to 2.81½c. Store prices have also been advanced, and we quote on lots from warehouse stocks as follows: No. 10, 2.10c to 2.15c; No. 12, 2.15c to 2.20c; No. 14, 2.20c to 2.25c; No. 16, 2.30c to 2.35c; Nos. 18 and 20, 2.50c to 2.55c; Nos. 22 and 24, 2.55c to 2.60c; No. 26, 2.70c to 2.75c; No. 27, 2.80c to 2.85c; No. 28, 2.90c to 2.95c; No. 29, 3c to 3.05c. Galvanized sheets, mill shipments, Chicago delivery, are quoted as follows: Nos. 12 and 14, 2.56½c; No. 16, 2.71½c; Nos. 18 and 21, 2.86½c; Nos. 22 and 24, 3.01½c; No. 26, 3.21½c; No. 27 3.41½c; No. 28, 3.61½c; No. 29, 3.86½c. Jobbers' prices on lots from store have also been revised, and are now as follows: Nos. 10 to 14 inclusive, 3.10c; No. 16, 3c; Nos. 18 and 20, 3.10c; Nos. 22 and 24, 3.25c; No. 26, 3.50c; No. 27, 3.70c; No. 28, 3.95c; No. 29, 4.40c; No. 30, 4.85c.

Structural Steel.—There are no new developments of any importance to report. Mills are swamped with specifications for quick deliveries, and are falling further behind in their shipments. Prices are without change and we quote carload lots, mill shipments, Chicago delivery, as follows: Beams and channels, 3 to 15 in. inclusive, 1.76½c; angles, 3 to 6 in., ¼ in. and heavier, 1.76½c; angles larger than 6 in. on one or both legs, 1.86½c; beams larger than 15 in., 1.86½c; zees, 3 in. and over, 1.76½c; tees, 3 in. and over, 1.86½c; with the usual extras for cutting to exact lengths, punching, coping, bending or other shop work. We quote the new prices from store as follows: 2c to 2.10c for angles, beams and channels, base sizes, with 2.10c to 2.20c for 18, 20 and 24-in. beams; tees and zees, 2.05c to 2.15c. These prices are for either random lengths or cut to specifications in excess of 5 ft.

Plates.—The demand continues of excellent proportions, the daily specifications greatly exceeding the daily tonnage of Western mills. Jobbers report an active business with store prices very firm. We quote carload lots, mill shipments, Chicago delivery, as follows: Tank steel, ¼ in. and heavier, 6¼ in. to 14 in. wide, rectangular plates only, 1.66½c; over 14 in. to 100 in., 1.76½c base; flange steel, 1.86½c base; marine steel, 1.96½c base, all full extras. Plates, 3-16 in. thick, $2 extra; gauges, 7 to 8, $3 extra; No. 9, $5 extra. Less than carload lots, $5 extra. Store prices have also been advanced. Revised quotations are as follows: Tank steel, ¼ in. and heavier, up to and including 72 in. wide, 2c; over 72 in. wide up to 100 in., 2.10c; over 100 in. wide, usual mill extras; 3-16 in. up to but not including 72 in. wide, 2.10c; 3-16 in., 72 in. wide, 2.35c; flange steel, 25c extra; heads, 25c extra.

Rails and Track Supplies.—Trading in light rails continues

to improve, and Western makers are getting better prices for their product than formerly. Track supplies are very active, the entire production in this territory going into immediate consumption. In heavy rails, there is little that is new to report regarding the local situation. The South Chicago mill is filled up for the year and the company has withdrawn from the market. All new inquiries are turned over to eastern mills of the corporation for delivery. We quote heavy sections in 500-ton lots and over f. o. b. mill, $28; less than 500 tons to carload lots, $30; less than carload lots, $32. Light rails are as follows: 12-lb. sections, $27; 16-lb., $26; 20 and 25-lb., $25; 30, 35, 40 and 45-lb. sections, $24, all f. o. b. Milwaukee mill. Track supplies, f. o. b. Joliet mill: Angle bars, 1.40c to 1.50c; spikes, first quality, 1.70c to 1.75c; track bolts, 3¼ x ¾, with square nuts, 2.40c to 2.50c per lb., with hexagon nuts, 2.55c to 2.65c.

Merchant Steel.—All that can be said with regard to this product is that specifications show no diminution. Mills continue to remain out of the market. Prices are without change, and on carload lots, Chicago, delivery, mill shipments, are as follows: Spring steel, 2.10c; sleigh shoe, flat sizes, 1.71½c; concave and convex, 1.86½c; cutter shoe, 2.35c; smooth finished machinery steel, 1.91½c; smooth finished tire, 1.86½c; plow steel, 2.20c and upwards, according to quality; toe calk steel, 2.21½c. Cold rolled shafting, 50 percent off in carload lots and 45 percent in less than carload lots. Crucible tool steel, 6½c to 8c; special grades of tool steel, 13c and upwards.

Merchant Pipe.—Business continues to come forward in good volume, jobbers and consumers placing in stock considerable material. All the pipe mills are running to full capacity, in some cases being behind in their orders. Prices are without change, and we quote carload lots, mill shipments, random lengths, f. o. b. Chicago, as follows:

MERCHANT PIPE.

	Steel.		Iron.	
	Black. Percent.	Galv. Percent.	Black. Percent.	Galv. Percent.
⅛ to ¼ inches	65.85	49.85	63.85	47.85
⅜ to ½ inches	69.85	57.85	67.85	55.85
¾ to 6 inches	73.85	63.85	72.35	62.35
7 to 12 inches	68.85	53.85	67.35	51.85
EXTRA STRONG PIPE.				
⅛ to ⅜ inches	58.85	46.85	56.85	44.85
½ to 4 inches	65.85	53.85	63.85	51.85
4½ to 8 inches	61.85	49.85	59.85	47.85
DOUBLE EXTRA STRONG PIPE.				
½ to 8 inches	54.85	43.85	52.85	41.85

Boiler Tubes.—The market is strong and demand very full We quote carload lots, mill shipments, Chicago delivery, as follows:

BOILER TUBES.

	Steel.	Iron.	Seamless.
1 to 1½ inches	42.35	39.35	53.00
1¾ to 2¼ inches	54.35	39.35	40.00
2½ inches	56.35	44.35	43.00
2¾ to 5 inches	62.35	51.35	Up to 4½ inches 50.50
6 to 13 inches	54.35	39.85	.....

Less than carload lots from store, as follows:

	Steel.	Iron	Seamless Steel
1 to 1½ inches, inclusive	40	35	42½
1¾ to 2¼ inches, inclusive	50	35	35
2½ inches, inclusive	52½	35	37½
2¾ to 5 inches, inclusive	60	47½	47½
6 inches and larger	50	35	

Cast Iron Pipe.—The leading interest has closed a contract for 12,000 tons of pipe for Cincinnati, O., the sizes ranging from 48 in. to 60 in. This is the only contract of importance closed since our last report. The town of Alpena, Mich, is asking bids on 2,500 tons of pipe which contract will be let Saturday, March 25. Prices are without change, and we quote carload lots, Chicago delivery, as follows: 4-in., $29; 6-in. and larger, $28; gas pipe $1 a ton higher.

Wire Products.—No diminution is to be noted in the demand for wire materials. Especially heavy are the specifications for nails and farm fencing, including barbed wire, poultry netting, etc. Orders from the manufacturing trade are both heavy and voluminous, and western mills are hard pressed to keep pace with the wishes of customers in their deliveries Prices are very firm and we quote carload lots to jobbers, Chicago delivery, as follows: Wire nails, $1.95; painted barb wire, $2.10; galvanized barb wire, $2.40; smooth annealed wire, $1.80; smooth galvanized wire, $2.10; polished staples, $2.05; galvanized staples, $2.35. Less than carload lots to jobbers are 5 cents higher than above prices. The retail trade is quoted 5 cents extra over the foregoing on carload lots, and 10 cents extra on less than carload lots. Bale ties are unchanged at 82½ and 5 percent and 85 percent discount f. o. b. Waukegan, Ill., on straight carload lots. Poultry netting, 85 and 5 percent discount from list f. o. b. Joliet and DeKalb, with actual freight allowed not exceeding 30 cents per 100 lb.

Foundry Coke.—There is a good market for coke in Chicago. Despite the large output of Connellsville ovens, the tonnage shipped west has not been up to consumptive requirements owing to the scarcity of cars in the East. The cheaper grades of fuel from Virginia and West Virginia ovens are plentiful and are being offered at low prices, but there is none too much of the Connellsville product in evidence. Prices are strong, and we quote Connellsville, 72-hour foundry coke, $3 to $3.25 at the ovens, or $5.65 to $5.90 Chicago. Less popular brands of Virginia and West Virgina cokes are selling at from $2.50 to $2.75 at the ovens. Wise county, Virginia, cokes are selling from $3 to $3.25 at the ovens, making the Chicago price $5.25 to $5.50.

Old Material.—Little change is to be observed in the local situation. Demand is light and is likely to continue so until the bar iron market improves. Some selling was done by railroads last week, the Rock Island getting top-notch prices for a lot of No. 1 R. R. wrought it offered for sale, some reports putting the figure at $16.75 to $17. There are two new lists on the market this week, one of 1,500 tons from the C. M. & St. P. Ry., and the other of 3,600 tons from the C. B. & Q. We have reduced our prices on old wheels 50 cents a ton, and on cast borings 25 cents a ton, sales of these products having been made at the lower figures during the week under review. We quote gross tons, as follows:

Old steel rails (4 feet and over)	$15 00 to 15 50
Old steel rails (less than 4 feet)	16 00 to 16 50
Old iron rails	19 50 to 20 00
Relaying rails, subject to inspection	22 00 to 22 50
Relaying rails, without inspection	20 00 to 20 50
Old wheels	16 00 to 16 50
Heavy melting steel	14 50 to 15 00
Mixed country steel	9 50 to 10 50
Low phosphorus scrap (.05 and under)	14 00 to 14 50

The following quotations are for net tons:

No. 1 R. R. wrought	16 50 to 17 00
No. 2 R. R. wrought	15 50 to 16 00
Shafting	17 50 to 18 00
Dealers' forge, No. 1	12 00 to 12 50
Wrought pipe and flues	11 50 to 13 00
No. 1 cast, 150 lb. and less	13 50 to 14 00
No. 1 mill	11 00 to 11 50
No. 1 Busheling	11 50 to 12 00
No. 2 Busheling	10 50 to 11 00
Country sheet	8 00 to 8 50
No. 1 boilers, cut	11 50 to 12 00
Boiler punchings	13 50 to 14 00
Iron car axles	21 00 to 21 50
Steel car axles	16 50 to 17 00
Iron axle turnings	11 50 to 12 00
Steel axle turnings	11 00 to 11 50
Cast borings	8 00 to 8 50
Mixed borings, etc.	8 00 to 8 50
Machine shop turnings	11 00 to 11 50
Railroad malleable	13 00 to 13 50
Agricultural malleable	12 00 to 12 00
Stove plate and light cast scrap	11 00 to 11 50
Old iron splice bars	18 00 to 18 50

CLEVELAND.

OFFICE OF *The Iron Trade Review*,
BROWNING BUILDING, March 22.

Iron Ore.—Shipments from docks to furnaces are increasing daily. Owing to the heavy chartering previously done, very little additional tonnage has been contracted for during the week. All lake interests are actively engaged in making preparations for the approaching season. Some belated inquiries for ore are being received, but there is very little except silicious ore obtainable.

Pig Iron.—Reports from foundries indicate improved de-

mand for castings and the outlook is regarded by foundrymen as very favorable. We note one sale of 500 tons for delivery over the last three months of this year and the first two of 1906. This is exceptional in the length of period of delivery, although buyers are manifesting more interest in future requirements and considerable iron has been sold for the last half. The usual quotation is now $16 Valley for No. 2, regardless of time for delivery. In spite of the tremendous production of pig iron, as shown by blast furnace statistics, it is predicted by some observers that before the first of June there will be a scarcity of foundry iron. One large interest which has sold up to Sept. 1 and last week made an advance of 50 cents, expecting that the higher price would stop the buying for a time at least, has placed orders this week at the advanced quotation. For Southern the price of all but one interest is $13.50 Birmingham for No. 2, while the one company is asking $13.75. We quote as follows, Cleveland delivery:

Bessemer	$16 35 to 16 50
No. 1 Foundry	16 75 to 17 00
No. 2 Foundry	16 25 to 16 50
No. 3 Foundry	15 50 to 15 75
No. 2 Southern	17 35
Gray Forge	15 75 to 16 00
Gray Forge, Southern	15 85 to 16 00
Lake Superior charcoal	18 00 to 18 50

Finished Material.—Orders continue to pile up at the mills while the uncertainty concerning delivery increases. Jobbers, on account of the delay in deliveries from mills, are doing a large business from store. Car manufacturers are almost the only buyers of bar iron, but they are ordering liberally. The ordinary quotation is 1.60c at the mill. Since the advance in steel bars to 1.59½c Cleveland, or 1.30c Pittsburg, the demand has been very light and it is not expected that new orders will be placed to any considerable extent before midsummer. The sheet situation is very strong and the mills are about four weeks behind in deliveries. The price of blue annealed has been advanced $1 per ton and of lighter gauges of black sheets $2 per ton. The prices of the principal producers through jobbers are as follows: Cleveland delivery, the freight from Pittsburg being 9½ cents: Mill sales of black sheets in carload lots No. 10, 1.89½c; Nos. 11-12, 1.94½c; No. 14, 2.04½c; No. 16, 2.09½c; No. 27, 2.49½c; No. 28, 2.59½c. Galvanized, mill sales, No. 14, 2.64½c; No. 16, 2.74½c; Nos. 18-20, 2.89½c; No. 22-24, 3.04½c; Nos. 25-26, 3.24½c; No. 27, 3.44 1-3c; No. 28, 3.64½c. Out of stock, black sheets, ¼ in., 1.95c; 3-16 in., 2.05c. Blue annealed, No. 10, 2.15c; No. 12, 2.20c; No 14, 2.25c; No. 16, 2.35c. One pass cold rolled: Nos. 18-20, 2.55c; Nos. 22-24, 2.60c; No. 26, 2.65c; No. 27, 2.70c; No. 28, 2.80c; No. 30, 3.20c. Galvanized out of stock, No 16, 2.95c; Nos. 18-20, 3.05c; Nos. 22-24, 3.20c; No. 26, 3.40c; No. 27, 3.60c; No. 28, 3.80c; No. 30, 4.60c.

Old Material.—Mills having scrap for sale are disposed to hold it for higher prices, but the iron mills, which are buyers of scrap, are still reluctant about placing orders. On the whole, the outlook seems to be favorable for a stiffer market. Prices have not changed since last week. We quote as follows, gross tons, Cleveland:

Old iron rails	$23 00 to 23 50
Old steel rails (over 6 feet)	16 00 to 16 50
Old steel rails (under 6 feet)	16 50 to 17 00
Old car wheels	16 50 to 17 00
Steel boiler plate	13 00 to 13 50
Steel axles	17 50 to 18 00
Malleable iron (railroad)	16 00 to 16 50
Malleable iron (agricultural)	14 00 to 14 50
Heavy steel	16 00 to 16 50

We quote as follows, net tons:

No. 1 R. R. wrought	16 50 to 17 00
No. 1 busheling	14 00 to 14 50
No. 1 machine cast	14 50 to 15 00
Iron axles	20 00 to 20 50
Axle turnings	12 00 to 12 50
Wrought turnings (free from cast)	11 50 to 12 00
Grate bars	10 00 to 10 50
Pipes and flues	13 00 to 14 00
Tank iron	10 50 to 11 00
Hoop and band iron	9 00 to 10 00
Sheet iron	7 00 to 8 00
Wrought drillings	11 50 to 12 00
Stove plate	10 50 to 11 00
Cast borings	8 00 to 8 50

CINCINNATI.

March 21.

Coke.—The market is steady and slightly more active. Foundry coke is quoted at a range of $2.75 to $3.25 per ton f. o. b. ovens. These prices represent extremes and the average quotation is $3. Furnace coke on contracts is quoted at $2.35 to $2.50 f. o. b. Connellsville.

Pig Iron.—The past week has developed practically no change in the market either as to volume of business or prices. Inquiry is moderate, there being only one important request for quotations submitted. This comes from an Ohio manufacturing concern and calls for about 2,500 tons on an analysis basis. Among other inquiries are one for 300 tons of Southern iron for last half delivery and one for 200 tons for the second quarter. Sales have been quite moderate and the rank and file of buyers of foundry iron in this territory have either enough iron for their needs or are holding off. One important Southern producer has advanced its asking price to $13.75 for No. 2 Birmingham, which quotation fails to take business. From the reports of activity in the East and the generally strong position of the steel market, furnace interests appear to be firmly maintaining prices. At the same time the demand for foundry iron through the Cincinnati sale agencies is not sufficient to give the situation an appearance of strength. There is quite general expression given to the belief that with the advent of spring the demand for this class of iron will materially improve and with but few exceptions the trade is inclined to view the market hopefully. In Northern irons there appears to be less tendency to shade prices than was noticeable two or three weeks ago. The minimum quotation for No. 2 at Southern Ohio furnace is now regarded as $15.75. We quote f. o. b. Cincinnati as follows:

Southern Foundry No. 1	$16 75 to 17 00
Southern Foundry No. 2	16 25 to 16 50
Southern Foundry No. 3	15 75 to 16 00
Southern Foundry No. 4	15 25 to 15 50
Southern Foundry No. 1, soft	16 75 to 17 00
Southern Foundry No. 2, soft	16 25 to 16 50
Gray Forge	15 00 to 15 25
Norhtern Foundry No. 1	17 40 to 17 65
Northern Foundry No. 2	16 90 to 17 15
Northern Foundry No. 3	16 40 to 16 65
Southern Charcoal	19 50 to 19 75

Finished Material.—In the finished steel lines there is constantly increasing activity and mills are getting further behind on orders. This is causing jobbers to have an active demand for all descriptions of material and stock is difficult to replenish. Prices are unchanged but well maintained. Bar iron is quiet. Bar iron is quoted at 1.60c to 1.65c; steel bars at 1.63c, half extras, with dealers quoting 1.85c for iron and steel out of store. Galvanized sheets at 75 and 7½ percent off. We quote black sheets, No. 27, at 2.40c in car lots of 500 bundles. Black sheets out of store are selling as follows: No. 28, 2.70c; No. 27, 2.60c; No. 16, 2.20c; No. 14, 2.10c; No. 12, 2.05c; No. 10, 2c. Tank plates are firm and sell out of stores at 2c for ¼-in. and 2.10c for 3-16 No. 8 and No. 10. Beams and channels are quoted at 2c from stock, and angles at 2c to 2.05c for base sizes.

There is no change in the merchant pipe market and demand continues quite satisfactory. Independent mills are still keeping close to the schedule. We quote f. o. b. Cincinnati as follows:

MERCHANT PIPE.

(Basing Discounts.)

	Steel Pipe.		Guaranteed. Wrought Iron Pipe.	
	Black. Percent.	Galv. Percent.	Black. Percent.	Galv. Percent.
⅛ and ¼ inches	65.85	49.85	63.85	47.85
⅜ and ½ inches	69.85	57.85	67.85	55.85
¾ to 6 inches	73.85	63.85	77.85	62.35
7 to 12 inches	68.85	53.85	67.35	51.85

Old Material.—An easy tone prevails and the market remains dull. Prices are not quotably changed but are largely nominal. We quote:

Old No. 1 railroad wrought, net tons	$16 50 to 17 00
Cast machine and foundry, net tons	13 50 to 14 00
Old iron rails, gross tons	20 00 to 21 00

Old steel rails, gross tons	15 00 to 15 50
Old short lengths, gross tons	14 00 to 14 50
Old iron axles, net tons	19 00 to 20 00
Stove plate, net tons	9 50 to 10 00
Wrought turnings, net tons	12 50 to 13 00
Cast borings, net tons	9 00 to 9 50

NEW YORK.

OFFICE OF *The Iron Trade Review*,
ROOM 1315, No. 150 NASSAU ST., March 21.

Pig Iron.—The local pig iron market during the past week was a repetition of the excellent conditions which prevailed in the week previous. Sales footed up a large tonnage, running mostly to small lots, with a clock-like regularity to the orders. The most activity was in foundry grades, and the good account which this department of the trade has given of itself recently, as well the promising aspect the immediate future bears, indicates that foundrymen are beginning to share at last in the improvement which has materialized in other lines. Sales recently made have called for deliveries ranging from prompt to the end of the second quarter, especially the latter; but there are some buyers feeling the market for the remainder of the year. Important furnace interests are willing to take these orders at an advance of 25 to 50 cents over present prices, while some smaller sellers have been quoting $13.50 for third quarter. Northern No. 2 foundry is firmly held at $16.75 at Eastern Pennsylvania furnaces, although a week ago $16.50 was possible. While other sections report Southern No. 2 foundry selling at $13.75 Birmingham, this is the price for small lots here; contracts for large lots can be closed at $13.50. Negotiations in the proposed Southern iron merger have again been taken up, but nothing definite is obtainable concerning them. New York quotations at tidewater follow: Northern No. 1 foundry, $17.75 to $18.25; No. 2 foundry, $17.25 to $17.75; No. 2 plain, $16.75 to $17.25; Southern No. 1 foundry, $17.75 to $18; No. 2 foundry, $17.25 to $17.50; No. 3 foundry, $16.75 to $17; No. 4 foundry, $16.25 to $16.50. Pig iron warrants are as follows:

	Bid.	Asked.
March	$16 65	$16 80
April	16 50	16 80
May	16 50	16 90
June	16 50	16 90
July	16 50	16 80

Finished Iron and Steel.—Business in structural shapes was very good during the past week, alike in sales made and those in prospect. The only important contracts closed were for 4,000 tons from the Erie road and for 1,100 tons for a new bank building in this city, both going to the American Bridge Co. The Boston Bridge Works booked an order for about 2,500 tons from the Boston & Albany road, though some reports erroneously put it at 9,000 tons. Small sales for new industrial works were about 3,500 tons, with new inquiries from the same source aggregating about 6,000 tons. The railroads are out with new bridge specifications amounting to between 15,000 and 20,000 tons, the most of it in excellent shape for early closing. The structural situation in this city is still very dull. The market for plates and bars shows no change from the normal trade of the past few weeks, although the future looks brighter. Jobbers had an increased demand for sheets just preceding the advance announced within the week. We quote New York prices at tidewater: Angles, 3 to 6 in. x ¼ in. and heavier, 1.74½c; beams, 3 to 15 in., 1.74½c; channels, 3 to 15 in., 1.74½c; beams, 18, 20 and 24 in., 1.84½c; tees, 3 x ¼ in. and heavier, 1.79½c; plates, carloads, tank, 1.74½c; flange, 1.84½c; marine and ordinary firebox, 1.94½c; refined iron bars, 1.64½c; soft steel bars, 1.64½c to 1.67c; sheets, in carload lots, New York, No. 28, black, 2.60c to 2.65c; galvanized, 3.65c to 3.70c.

Old Material.—There has been no appreciable change in the market, but holders continue to ask prices considerably in advance of what buyers are willing to pay. Were it not for this sales would be much larger. Quotations show no change over last week, but it is noticed that there is more bearish talk concerning them than usual. Heavy steel scrap continues the strong feature. Approximate prices f. o. b. New York follow:

Old iron rails	$20 00 to 22 00
Old steel rails, long lengths	16 00 to 17 00
Old steel rails, short pieces	15 50 to 16 50
Relaying rails	21 00 to 22 00
Old car wheels	17 50 to 18 25
Old iron car axles	21 75 to 22 75
Old steel car axles	19 00 to 19 75
Heavy melting steel scrap	16 00 to 17 00
No. 1 railroad wrought scrap	20 00 to 20 50
Iron track scrap	17 00 to 18 50
Wrought pipe	15 00 to 15 50
Ordinary light iron	12 00 to 13 00
Cast borings	10 00 to 10 50
Wrought turnings	13 50 to 14 00
No. 1 machinery cast	16 00 to 16 50
Stove plate	13 50 to 14 00

PHILADELPHIA.

March 21.

The leading feature of the week has been the strong demand for foundry irons. Furnaces are not anxious to make sales, as their order books are unusually well filled; in fact, the number of orders placed is unprecedented, and there is some doubt whether the iron will be taken as agreed. Prices are unchanged, as follows: No. 1 X foundry, $18 to $18.25; No. 2 X foundry, $17.50 to $18; No. 2 plain, $17 to $17.50; standard gray forge, $16 to $16.50; ordinary gray forge, $15 to $15.75; basic, $16.75 to $17; low phosphorus, $20 to 20.50.

Finished Material.—There is no great rush of new business, but the mills have all the orders they can take care of. Prices are firm as follows: Beams, channels and angles, according to specifications, 1.73½c to 1.85c; small angles, 1.65c to 1.68c; steel bars, 1.63½c to 1.68½c; refined bars, 1.67½c to 1.80c; plates, 1.73½c to 1.78½c.

Old Material.—Business continues dull. Prices are stationary. We quote as follows: No. 1 steel scrap, $17.50 to $18; low phosphorus scrap, $20.50 to $21.50; old steel axles, $20 to $21; old iron axles, $24 to $25; old iron rails, $24 to $24.50; old car wheels, $16.50 to $17.50; choice R. R. No. 1 wrought, $22 to $23; machinery scrap, $15.50 to $16; wrought turnings, $15 to $15.50; cast borings, $11.25 to $11.50; stove plate, $13.50 to $14; wrought iron pipe, $16.50 to $17.

BIRMINGHAM.

Birmingham, Ala., March 20.—There is a steady sale of iron in the Southern territory and quite a number of orders have been booked for delivery during the last half of the year. Prices have stiffened some in the past ten days, No. 2 Foundry is now being sold by one company at $13.75 as a minimum. Special analysis iron is selling at from 50 cents to $1 per ton over the regular run of iron. Small shipments of pig iron are being rushed to Mexico, the Alabama Consolidated Coal & Iron Co. during the past week shipping a car load of No. 2 soft iron by fast freight to Orizaba, Mex. for use in a railroad foundry. An improved demand is felt in the Southern territory for foundry iron. Indications point to a strong demand for the remainder of the year.

The Sloss-Sheffield Steel & Iron Co. is the only iron making company in this section announcing publicly that it has accumulated iron on its yards. There is no anxiety, however, to sell much iron ahead by this company. Up to the 17th inst. it had booked orders for delivery during the last half of the year in the present month aggregating 25,000 tons of iron. During February the company sold 60,000 tons of iron, nearly two months' make. Second Vice President J. W. McQueen states that the market is very strong and satisfactory.

The following quotations are given: No. 1, foundry, $13.75 to $14; No. 2, foundry, $13.50 to $13.75; No. 3, foundry, $13 to $13.25; No. 4, foundry, $12.75 to $13; gray forge, $12.25 to $12.50; No. 1, soft, $13.75 to $14; No. 2, soft, $13.50 to $13.75.

A cast iron pipe plant will be erected in Sheffield. The plant, according to statements made by J. W. Worthington, will cost $350,000. The cast iron pipe works already estab-

lished in this district are working hard to fill orders on hand. The United States Cast Iron Pipe & Foundry Co. has just completed a large shipment of water pipe to Panama zone. Good prices prevail for cast iron pipe.

The Birmingham rolling mills, (Republic Iron & Steel Co.) are still idle. The statement is made that the mills are closed for lack of orders. The Gate City mills, (Republic Company), are doing nicely, as well as the Bessemer rolling mills, Tennessee Coal, Iron & Railroad Co., where steel is being worked entirely. The new improvements recently made in the Bessemer mills are showing up well.

The Metal Market.

NEW YORK.

OFFICE OF *The Iron Trade Review,*
ROOM 1315, No. 150 NASSAU ST., March 21.

Pig Tin.—While prices during the week advanced slightly, the market in general has been without any new feature. Speculative interests are in control, and the future course of prices is mainly in their hands, with the belief general that they are too high now. The London market has been very strong and active, and prices advanced nearly £2. Today's closings here follow: Spot and March, 29.65c to 29.80c; April, 29.50c to 29.75c; May, 29.50c to 29.65c. London's closings today follow: Spot, £136 2s 6d; futures, £134 10s. Arrivals at Atlantic ports for the month to date aggregate 2,295 tons, with 4,176 tons afloat.

Copper.—The market continues in a listless state, with prices unchanged. The export trade is the redeeming feature, with shipments to China a puzzling feature, as no one knows what use is to be made of the metal. Some 18,000 tons have been sent to that country during the past few months. The London market has been fairly active, with prices a little lower. Today's closings here follow: Lake, 15¼c to 15⅜c; electrolytic, 15⅛c to 15¼c; casting, 14⅞c to 15c. London's closing today follow: Spot, £68 3c 9d; futures, £68 11s 3d. Exports for the month to date aggregate 13,293 tons.

Lead.—The leading interest advanced 30-day shipments of 50-ton lots five points to 4.50c. Spot remains steady at 4.50c to 4.60c. St. Louis is stronger at 4.40c to 4.42½c. London advanced to £12 8s 9d.

Spelter.—Is quiet and firm at 6.15c to 6.25c. St. Louis is weaker at 5.95c to 6c. London slightly lower at £23 7s 6d.

Antimony.—Cookson's is firmer at 7⅞c to 8⅛c. Hallett's is stronger at 7⅞c to 8⅞c, as are other grades at 7c to 7.65c.

Quicksilver.—We quote $38 per flask of 75 lb. lots of 100 flasks. London is £7 12s 6d.

CHICAGO.

OFFICE OF *The Iron Trade Review,*
1164 MONADNOCK BLOCK, March 21.

The large export demand for metals, in addition to the increased domestic consumption, has greatly stiffened the local market. Copper has advanced ¼c; pig lead, $1 a ton, and pig tin ½c. Both spelter and sheet zinc are very firm, and advances are expected in these products shortly. We have revised our prices, and quote Chicago deliveries, as follows: Lake copper in carloads, 15½c; less than carload lots, 15¾c. Casting copper, carloads, 15¼c; less than carload lots, 15½c. Spelter, 6¼c for carload lots, and 6½c to 6¾c for smaller lots. Sheet zinc, 7¼c for carload lots of 600-lb. casks, and 7½c for less than carload lots. Pig lead, 4.50c for 50-ton lots; 4.55c for carload lots, and 5c for less than carload lots. Pig tin, 30¼c for carload lots, and 30½c for less than carload lots. Cookson's and Hallett's antimony, 9c. Nickel is 45c to 60c, according to amount and deliveries.

The demand for old metals is rather light, and prices are without material change. Dealers' quotations are approximately as follows: Copper wire, 13¼c; heavy copper, 12¾c. Light copper, 11¾c. Red brass, 11¾c; red brass borings, 10⅛c. Yellow brass, 8¾c; yellow brass borings, 7½c. Pipe lead, 4c. Tea lead, 3.60c. Zinc, 4¼c.

Lake Superior Iron Mines.

The stock piles at the mines in the vicinity of Crystal Falls, Mich., are growing rapidly. It is probable that the piles will be fully as large as they were at the opening of navigation last year, when shipments were delayed on account of the strike on the lakes. At the Tobin mine ore is being accumulated in large amounts. The Bristol is fully as far advanced as last year, and the Great Western is showing up well. At the Lamont the frame work for the new shaft is being hoisted. Considerable work remains to be done on the shaft house before it will be in shape for use. There is no new development at the Crystal Falls mine. The ore that is being hoisted comes from the old openings. The lease upon the property expires about the middle of the summer and it is understood that there is some difference of opinion among the fee owners and the operators as to what should be the basis of a new lease. The fee is owned by Luke Welch and the Sheldon estate.

Much more interest is manifested in Vermilion range mines than for some time. The old Tower hard ore mines, at Soudan, which were opened in 1884, but have been down for some two years, have been reopened and are employing about 300 men. The mines are hoisting about 700 tons a day out of two shafts, and some of the older ones have been abandoned, probably permanently. Near Tower, on an island in Vermilion lake, there is an outcrop of slatey hematite, and this is to be explored this year. It belongs to the Kitto family, of Tower, and is under option to Alf Merritt, of Duluth. There is nothing doing in any exploration on that range, other than the single drill working on Section 30, near Ely, and that drill is to be taken off soon, and, according to the company, is to be replaced by a sinking crew.

Malta, Elba and Corsica, of Pickands, Mather & Co.'s McKinley group, have about 100,000 tons in stock and are mining heavily, in anticipation of the largest year they have ever had. Malta has been developing to a material extent the past year.

The Oliver Iron Mining Co. has ordered ten locomotives for its Mesabi range open pit mines, most of them to be used in company stripping operations. The company is to carry on a large part of its development work itself, and will rely less upon contracting firms than heretofore. In the Hibbing district this company will operate all its mines but two or three. Sharon and Penobscot will be idle, and Munroe and perhaps Myers, both new mines, will ship little, but these latter two are new properties and are hardly in shape for heavy mining operations this season. In the Mountain Iron district the company has only one mine and that will run about as usual. In the Virginia and Eveleth districts it will not operate the Auburn, and neither Ohio, Oliver nor Sauntry is to be a shipper to any large extent, Sauntry possibly not at all. In Fayal it will have an enormous shipper, for the new extension of the No. 1 pit is about completed and the new No. 4 shaft is expected to make an excellent showing. Adams and Spruce will both mine heavily. The former has a large new pit for milling and both have been developed heavily the past winter. East from Eveleth are but few mines of the Oliver Company. At the Genoa there will be the same production as usual, and the company has almost nothing from there eastward. The new Stephens, which has been extensively developed, but has never been a producer, is to be a heavy shipper this year and ought to break some records for cheapness and speed.

The Oliver company's mines in the Hibbing district, commencing at the east side of 58-20 and running westerly as far as the Mahoning, are: St. Clair, Myers, Munroe, Chisholm, Clark, Glen, Pillsbury, Burt, Sellers, Day, Hull, Rust, Penobscot.

NEW WORK PLANNED OR UNDER WAY.

The Wayne Stove Co., Fort Wayne, Ind., recently incorporated with a capital of $50,000, has not yet decided whether it will build this year. The company has received offers of buildings and land in several cities, but has not yet accepted any of the offers.

Work on the new office and manufacturing buildings of the Aldine Grate & Mantel Co., Grand Rapids, Mich., will be begun this month. The foundry will be 50 x 100 ft. The factory for wood and iron working will be 50 x 125 ft.

The Bethlehem Steel Corporation will enlarge its Harlan & Hollingsworth plant, Wilmington, Del., but is not ready to give details as to its plans.

H. C. Campbell, Joseph Supple and others will build a plant at East Water and Belmont streets, Portland, Ore., to manufacture rotary engines.

Goldens Foundry & Machine Co., Columbus, Ga., is erecting a new foundry 250 x 100 ft. A two-story addition to the company's machine shops, 80 x 100 ft., has just been completed.

The new buildings of the Coulter Disc Co., Galesburg, Ill., are nearing completion. Boilers and engines have already been installed.

The Midvale Steel Co. has awarded a contract for a building 165 x 550 ft. and 65 ft. high, to be used in connection with the manufacture of armor plate for the government. It will be designated Ordnance Building No. 4. It will be of brick and structural steel, and will be equipped with two large electric cranes. The foundation will be of extra heavy concrete, which will be necessary on account of the ponderous machinery used for the manufacture of armor plate.

It is reported that the Great Northern Railroad will commence work soon upon an addition to the car works at St. Cloud, Minn.

The Minneapolis, St. Paul & Sault Ste. Marie Railway Co., will build an addition to its machine shop at Minneapolis. The new building will be two stories, 123 x 138 ft. It is expected it will be completed Aug. 1.

The directors of the Columbus Structural Steel Co., Columbus, O., have decided to locate the new plant at the west end of Buttles avenue. Work on the erection of the building will begin at once.

The Barcus Mfg. Co., Wabash, Ind., whose foundry was destroyed by fire March 5, will rebuild at once, having already let the contract for a stone building 60 x 126 ft. This is to be finished as early as April 20. The machine shop and other buildings of the company were not damaged by the fire.

George H. Blakeley was on March 20 appointed receiver of the Cyclopean Iron Co., of Paterson, N. J. The application for the appointment of receiver was made by William F. Jones, manager of the company. It was announced that the company was in financial difficulties due to the exposures following the official investigation into the affairs of Passaic county. Several freeholders and officials of the Cyclopean company have been indicted and one freeholder has been tried and convicted. The investigation has resulted in the stoppage of payment on a large amount of bridge and culvert work for which the Cyclopean company had the contract.

A petition in involuntary bankruptcy was filed in the United States district court March 21 by the Jones-Laughlin Steel Co., the Cleveland Gas Light & Coke Co., and A. M. Moreland against the Vulcanus Forging Co. of Cleveland. The claims alleged against the company aggregate more than $80,000. The company went through assignment proceedings in the insolvency court on March 8, and C. O. Gilbert was appointed assignee.

The plant and real estate of the Georgia Car & Mfg. Co., Savannah, Ga., was offered for sale on March 7, and was bid in by M. A. O'Byrne, of Savannah, for $32,500. The court, however, declined to confirm the sale and has made an order for another sale of the property. The Savannah Trust Co. is the trustee.

Grade Crossing Bridges in Cleveland.

Mayor Johnson and City Engineer Carter, representing the city of Cleveland, have agreed with Pennsylvania R. R. Co. officials on an elaborate plan for abolishing grade crossings of the C. & P. R. R. in that city. The railroad runs a distance of seven miles through the city, crossing 35 streets at grade. The plan provides for the lowering of the grades of the streets several feet and for the building of 35 steel bridges, which will require about 200 tons of steel each. The work is to be done in sections and will cost about $4,000,000 exclusive of damage to abutting property. A series of ordinances will be passed, the first of which was introduced in the council March 20. Work provided for by this ordinance is to be completed within two years, but it is not expected that the entire plan will be carried out in less than ten years. The cost is to be shared by the city and the railroad.

The plant of the New York Lock Co., Branford, Conn., has been sold at auction to F. A. Williams, of New Haven, Conn., representing the bondholders, most of whom are New York men. The purchase price represents the equity, the plant being subject to a mortgage of $65,000.

The plant of the Morgantown Tin Plate Co., Morgantown, W. Va., was sold at auction sale last week under a decree of bankruptcy to John G. Frazer of Pittsburg for $154,100. The plant cost $250,000 and about $40,000 will be required to complete it.

Spang, Chalfant & Co., Incorporated, Pittsburg, will remove their butt weld department, recently destroyed by fire, from its present location to a point near mills Nos. 4 and 5. The warehouse is to be rebuilt on a new site. The location of the new departments will be such that the annual floods will not interfere with their operation.

The Lawrence Furnace, located at Ironton, Lawrence county, O., was sold March 14 to E. J. Bird, who will put it in good repair and make a 125-ton furnace of it. It is expected that the furnace will be making iron in July. Mr. Bird will form a company of $160,000 capital and call it The Bird Iron Co. Address S. P. Bacon & Co., 142 E. Fourth street, Cincinnati.

The Cherokee furnace of the Alabama & Georgia Iron Co., at Cedartown, Ga., is being prepared to be blown in.

The manufacturers of nuts and bolts, at a meeting held in New York last week, advanced prices 2½ percent.

The Bray continuous tin plate mill at the Monongahela works of the American Sheet & Tin Plate Co., Pittsburg, resumed operations this week.

At the annual meeting of the Standard Steel Car Co., held at Pittsburg last week, it developed that the interests of the Schoens who organized the Pressed Steel Car Co. and a number of smaller stockholders had been purchased by the Mellons of Pittsburg, the organizers of the Union Steel Co., which was sold to the United States Steel Corporation. John M. Hansen was re-elected president, James B. Brady, vice president, and William Bierman secretary, in place of A. S. Valentine who recently retired to accept a position with the Pennsylvania Malleable Co. L. G. Woods retired as treasurer and was succeeded by J. W. Williams. The following directors were elected: John M. Hansen, R. B. Mellon, W. L. Mellon, L. G. Wier, Edwin Hawley, J. B. Brady, Henry R. Rea and Henry Aiken.

EASTERN PENNSYLVANIA.

Harrisburg, Pa., March 21.—Furnaces in the valleys of Eastern Pennsylvania continue to be fired up and there is now a scarcity of labor reported from a number of the industrial centers. The former forces of employees of many establishments which have not been working full time the last two years have been scattered and there is a vigorous hunt for men. Foreigners are reported to be scarce in some parts of the state and farm laborers are being offered inducements to work in the mills, although for these men the railroads are bidding. Skilled men are much in demand and papers contain many advertisements for them.

Among the furnaces which are being made ready for starting are North Cornwall, controlled by the Lackawanna Iron & Steel Co. and one of the twin Bird Coleman stacks. These furnaces are in the Lebanon district where the Lackawanna has started three furnaces within a month. The Pennsylvania Steel Co. is preparing two stacks at North Lebanon and the Lebanon Valley Furnace in the same district is being extensively overhauled.

The Berkshire Iron Works have started one of the furnaces at Sheridan and are planning to put the other to work if desired. A few miles away the Robesonia furnace is being put into shape. The Robesonia Iron Co., Ltd., has agreed to extend its partnership for ten years under the former agreement.

In Berks county the Empire Iron & Steel Co. is making ready Macungie furnace and that will make almost the last of the available furnaces in that county to go into blast, there being few others which are idle.

The Thomas Iron Co. is making its No. 7 furnace at Lock Ridge ready to start. Emaus furnace has been stopped by the Reading Iron Co. for repairs, but will start again when they are completed.

In Daupin county the Harrisburg works are all busy, most of them having every department at work. The Central Iron & Steel Co. is now running four open hearth steel furnaces and the Harrisburg Pipe and Pipe Bending Co. its entire quota. There is only one blast furnace of seven in the county idle and it may be started by the Pennsylvania Steel Co. this Spring if found necessary. The Baltimore Brewing Co. has given an order for engine equipment to the Harrisburg Foundry & Machine Works. The Harrisburg Iron Co., recently started for a foundry business, is doing well. The Jackson Mfg. Co. has had some foreign orders and is increasing its business. Some machine work is now taken.

The Morse Iron Works of Erie have been granted a charter by the state department in this city. Its capital is $100,000.

The Eyre Construction Co. is arranging to start work on the state bridge at Selinsgrove for which it was lately awarded a contract.

The Philadelphia & Reading Railway Co. will spend several hundred thousands of dollars for improvements at its shops at Reading. This authority was given by the directors on March 16.

J. K. Petty & Co., incorporated, have taken over the boiler making plant of Messrs. Petty and Mader at Lebanon.

The Norcross Mfg. & Supply Co., to make dairy machinery and other articles has filed its charter at Reading. Frank M. York, of New York, is the principal owner. J. Wilmer Fisher, of Reading, is in charge of the legal interests of the firm at Reading.

The Addyston Cast Iron Pipe & Foundry Co. was the low bidder for supplying the Cincinnati Waterworks with pipe and castings for this year. Only two bids were received by the Board of Public Service. The Addyston Company bid $30,750 and the Dimmick Company, $32,875 for 500 tons of water pipe, 200 tons of special castings and 100 tons of loam castings.

OTIS ELEVATOR CO.'S REPORT.

In the report of operations submitted at the annual meeting of the stockholders of the Otis Elevator Co. a decrease in net earnings was shown of $17,000. Edmund A. Russell, Godfrey R. Redmann and W. S. Spalding were elected directors to fill vacancies in the board caused by the deaths of N. P. Otis, H. R. Reed and John A. Roche. All the other directors were re-elected.

Following is the statement for the year ended Dec. 31, 1904, with comparisons with the previous year:

	1904.	1903.	Decrease.
Net earnings	$ 891,016	$ 908,055	$ 17,039
Pref. dividend	335,970	332,670	*3,300
Balance	$ 555,046	$ 575,385	$ 20,339
Con. dividend	127,006	127,006	.....
Balance	$ 428,040	$ 448,379	$ 20,339
Depreciation	228,044	248,379	20,339
Surplus	$ 200,000	$ 200,000	.....
Prev. surplus	1,200,000	1,000,000	*200,000
Total surplus	$1,400,000	$1,200,000	*$ 200,000

*Increase.

President W. D. Baldwin in his report says: "The unsettled condition of the labor market in some parts of the country during the past year tended to very materially interfere with building operations, and your company's business in this country was less than in 1903, but the foreign business increasing over previous years made the total volume of sales for 1904 greater than for any year since 1902. The outlook for business during the coming year your directors considers favorable."

Proposed Railway Construction.

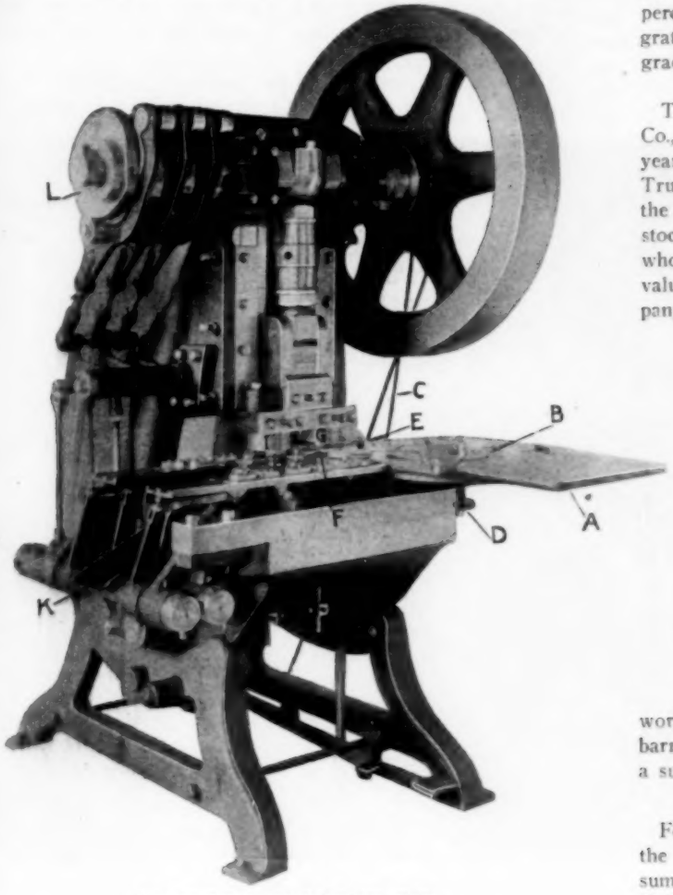
For the year 1905 there is promise of great activity in railway building. Last year showed a falling off of over 1,500 miles in the length of new track completed, compared with 1903, but before the year 1904 had closed there were evidences of a revival following the slump which began in the summer of 1903, and with the opening of spring these evidences are growing stronger. "Last year," says the *Railway Age*, "was devoted largely to the completion of lines which had been started in the previous year and had not been affected by the unfavorable conditions which caused a lull in railway building; but now fresh projects are taking life, and almost daily contracts are being let for the construction of new lines or extensions. A large mileage is projected to cover territory, the development of which only awaits transportation facilities, and such lines as these will be built—some of them this year and others in years to come. An effort to cull such projects as bear the stamp of genuineness results in showing a total of 7,500 miles now under construction or under contract, and 9,332 miles more which may be classed as live projects. The latter include lines showing signs of life and on which work may begin during the year."

Cincinnati Machinery for Japan.

Two representatives of the Japanese government were in Cincinnati a few days ago and closed a contract for machinery to build 20 saw and planing mills for the Japanese government. Negotiations begun with the Tokio representative of J. A. Fay & Egan Co. of Cincinnati firm some weeks ago, were closed. The contract price for the machinery is $40,000, and it will require 60 days to build it. The machinery, it is understood, will be shipped direct to Tokio, and from there distribution will be made to other points. It is the purpose of the Japanese government to use this saw and planing mill machinery for preparing lumber to be used in the manufacture of railway passenger and freight cars. Some of the cars are to be operated on railways in Japan, and the rest are to be used on the Manchurian railway.

PRESS WITH SPECIAL FEED.

A novel and interesting press has been built by the E. W. Bliss Co., of Brooklyn, N. Y. It is of clever design and was built for performing the second and third operation on shells which have been formed in a plain press. The first operation shell, as seen in Fig. 1 of the line engraving, is placed on the table A, where there is a friction dial B operated by the round belt C. A groove is cut in the outside hub of the fly wheel for this belt. The sheave pulley D at the bottom of the spindle, drives the friction dial. After the first operation shell has been placed on this dial, it is carried by friction against the automatic stop fingers E and these allow but one shell to pass through at a time. At the proper moment the fingers



A NEW PRESS WITH SPECIAL FEED.

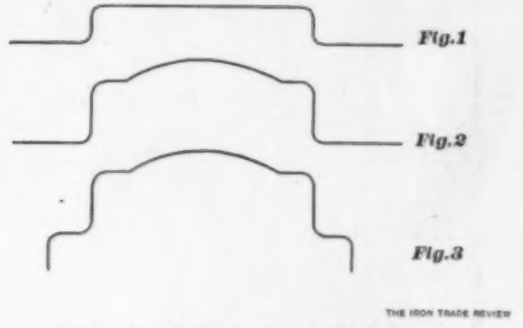
rise up and allow the shell to enter the grip jaws at F. These jaws then close on the work and travel laterally, carrying the piece to the first punch at G. As the slide descends the jaws open out and the shell drops into the die where it undergoes one operation. When the slide rises, the jaws F slide back to their former position, while the jaws H take a position directly opposite the shell which has just been operated upon.

The next motion carries the first shell under the second punch I and a new shell comes under the first punch. This time when the slide descends the press does two operations simultaneously, one in each die. After the second operation has been completed, the shell is slid along until it is clear of the feeding mechanism and then it drops down tthe chute K into a box. The press runs continuously at 75 strokes per minute and makes 150 operations, doing the work of several machines and operators without any handling. The cams L operate the driving mechanism. Fig. 2 is the second operation on the shell or the first in this machine; and Fig. 3 shows the completed article. The press is adapted for any work of this kind requiring three operations. The total weight of the machine shown is 4,000 lb.

Electric Ferro-Silicon.

George G. Blackwell, Sons & Co., Ltd., of Liverpool, Eng., announce that their new works for the manufacture of electric ferro-silicon on a large scale have been completed and will be in operation at the end of this month or early in April. The company will produce 25 percent, 50 percent, 70 percent and 75 percent ferro-silicon, and it is the expectation that this will be the largest operation in the world in this line. The metal will be particularly low in phosphorus and special regard will be had for purity. The company expects to furnish the 50 percent grade in a solid lump condition, avoiding the disintegration into coarse powder which sometimes occurs with this grade.

The entire plant of the Townsend-Downey Ship Building Co., which has been in the hands of a receiver for about a year, was sold a few days ago for $516,000 to the Colonial Trust Co., of New York, trustee for the bondholders. Of the amount for which the property sold, $51,000 was for the stock, $465,000 for the property, including the plant and the whole of Shooter's Island, N. Y. The plant was originally valued at $1,500,000, and the liability was $790,000. The company was established in 1890, and at first did considerable



SHOWING PROGRESS OF PRESS OPERATIONS.

work for the United States Government. Its financial embarrassment is attributed to trouble with its employes. After a succession of strikes a receiver was appointed.

Following the making of its common share capital full paid the American Iron & Steel Mfg. Co., Lebanon, Pa., has resumed dividends on the common stock by the declaration of a dividend of $1 per share. The regular quarterly dividend of 1¼ per cent was declared on the preferred. Both dividends are payable April 1. The company, which was incorporated in August, 1899, is a consolidation of the following properties: Pennsylvania Bolt & Nut Co., Lebanon, Pa.; East Lebanon Iron Co., Lebanon, Pa.; Lebanon Iron Co., Lebanon, Pa.; J. H. Sternbergh & Son, Reading, Pa., and the National Bolt, Nut & Rivet Works, Reading, Pa. J. H. Sternbaugh is president.

Henry Phipps, who is now in Mexico, has been interviewed in the City of Mexico and says there is no truth in the report that he contemplates purchasing the steel plant at Monterey. He said that his activity in the steel industry is ended, and that he will devote his remaining days to efforts for the improvement of the condition of the poor, particularly in New York City.

The affairs of the Wabash Bridge & Iron Co., Wabash, Ind., will soon be wound up. About $5,000, equal to about 2 percent of the claims, will be distributed among the creditors.

AUTOMATIC CONTROL OF MOTOR-DRIVEN PUMP.

There was recently installed by the Deane Steam Pump Co. an electrically-driven triplex pump in connection with a hydraulic plunger elevator, in one of the large business buildings in Holyoke, Mass. The elevator is of the hydraulic type, in which the car is supported by a long plunger working in a cylinder to which water is admitted as desired from a closed tank. This tank is supplied with water by a 5 x 8 Deane vertical triplex single-acting power pump designed for a maximum water pressure of 150 lb., and means are provided for automatically stopping and starting the pump to maintain a constant pressure in the tank between certain fixed limits. The pump is connected to a 15-h. p. General Electric induction motor operated by a three-phase, 60-cycle, alternating current at 550 volts. The motor has a variable starting resistance inside, which is thrown in and out by means of a sliding rod. The generator supplying the current to the motor is of such small size that it was feared that the fluctuations from the frequent starting and stopping of the motor would seriously affect the regulation of the potential of the distributing system and this motor was chosen to meet these conditions. In operating the motor the resistance is first thrown in so that, at starting, all resistance is in the armature circuit. As the motor increases its speed, the resistance is gradually cut out by a movement of the sliding rod. In stopping the motor the current is cut out by an oil-break switch and then the resistance is thrown in ready for another start.

For operating this type of motor automatically, there was no device obtainable, although numerous arrangements are in use for the ordinary motors, having starting boxes of the usual construction. A controlling device was therefore designed by the Deane Steam Pump Co. especially for this work, and the illustrations show this automatic controller arranged in combination with the motor and pump. A water pipe connects the elevator pressure tank with a Mason automatic belt shifter, consisting of a diaphragm chamber and a cylinder in which a piston moves. The pressure of the water beneath the diaphragm is balanced by a heavy weight and any variation of this pressure causes the diaphragm to move a pilot valve admitting water to the cylinder for moving the piston. This belt shifter is in connection with a special device, so that when the pressure in the elevator tank falls below a certain point the upward movement of the piston in the cylinder will first close a switch admitting current to the motor and then throw the resistance rod to remove the resistance. As soon as the pressure in the tank has been raised to the desired point, the controlling device operates first to open the switch to stop the motor and then to throw in the resistance by pulling out the resistance rod or shifter. This is accomplished by mounting a set of cam pawls upon a slide connected with the piston of the shifter cylinder to form a ratchet which engages a cam lever connected with the switch break. The cams are so formed that the switch lever is always thrown before the resistance is shifted, no matter in which direction the piston moves.

The successful operation of this device in connection with this type of motor has solved a serious problem in elevator work where the current is used for both lighting and power service and the generator is of small size. Practically the same arrangement of starting device has also been applied to the General Electric induction motor having a special external resistance.

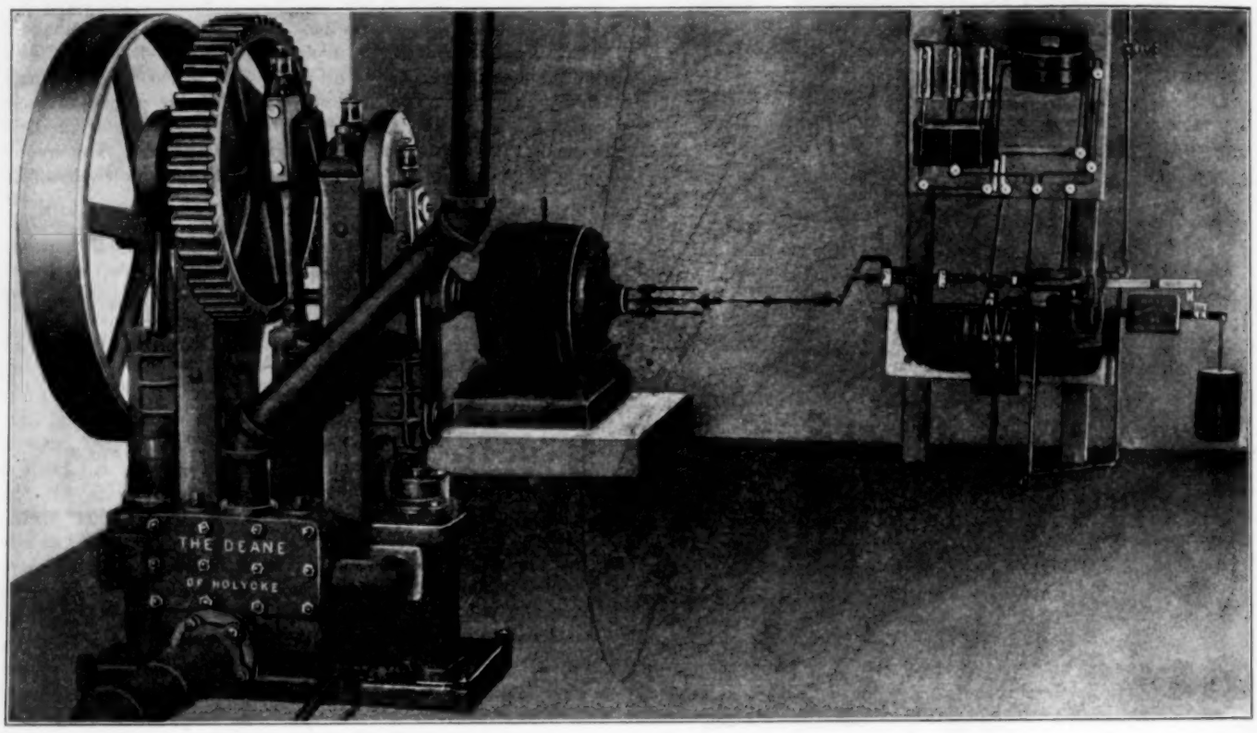


FIG. 1.—ELECTRICALLY DRIVEN PUMP WITH AUTOMATIC MOTOR CONTROLLER.

The directors of the United Shoe Machinery Co., Chicago, after declaring the regular quarterly dividend of 2 percent (fifty cents) per share on the common stock, issued a statement saying that as the new Beverly plant is nearing completion, and further expenditure will not be required in the near future, the question of giving to the common stockholders a portion of the accumulated profits in addition to the regular quarterly dividend was considered and referred to the executive committee, with a request that a special meeting of the directors be called as soon as it is ready to report.

The International Steam Pump Co.'s directors have declared the regular quarterly dividend of one-half of 1 percent on its common stock, payable April 1.

THE BY-PRODUCT COKE OVEN.*

BY W. H. BLAUVELT.

Broadly speaking, there are two methods in use for producing coke: First, distillation with admission of air into the coking chamber and a partial combustion of the fixed carbon of the coal as well as of the volatile matter, and second, distillation in a closed chamber, where no air is admitted and the heat enters through the walls of the chamber. This latter method is a true distillation and no part of the coal is consumed in the process.

While the American people have attained a position in the mechanical arts which excites the admiration and sometimes even the alarm of the old world, they are by no means in the van in the chemical industries. Among the more prominent industries in which chemical engineering has only recently obtained a foothold in this country is the manufacture of coke with the saving of the by-products. In Europe the industry has attained a very respectable age. In 1855 Pauwels, Dubochet and Carl Knab, working on different lines, successfully operated coke ovens where the tar and ammonia were saved. A few years later Carvès added side flues to Knab's design and the by-product oven in its essentials became a fact, although it was not until 1881 that the condensation of ammonia and tar was a success along with the production of a good quality of coke.

In 1870 two plants were supplying much of the illuminating gas used in Paris, although it was of a low illuminating power and had to be enriched with ordinary bench gas. While this work was going on in France, Huessener was developing an oven with horizontal flues in the side walls in Germany and Coppée in Belgium had brought out an oven with vertical flues, these designs being the pioneers of the two distinctive types of today. These original types have been greatly improved and perfected, of course: the apparatus for the collection and treatment of the by-products has been progressively developed until we have the modern by-product retort oven in its several types.

As Mr. Watson Smith has pointed out, the several different types of by-product oven, many of the less important of which have not been mentioned in this brief resume, have all sprung from three "root forms," namely, first, the modified beehive oven (itself a development of the "meiler" of the charcoal burners); second, the Coppée oven, the forerunner of the Otto type; and third, the Knab-Carvès oven, the ancestor of the Semet-Solvay type.

Before taking up another branch of the subject, it will perhaps be well to bring to your attention the radical differences in structure and method of operation between the old beehive oven, which is still the standard in this country, and the retort oven, arranged for the saving of the by-products, which has entirely replaced the beehive oven in Germany, for instance, although in this country and Canada there have been only some 3,400 built.

A beehive oven is dome-shaped, with a flat bottom, about 12 ft. in diameter and 7 ft. high. There is a hole in the top through which the coal is charged and a door in front for withdrawing the coke. These ovens are usually built in double or single rows, with a track on top so that the coal larry may discharge the coal directly into the oven. The charge of coal, from 5 to 6 tons, is fired from the heat remaining in the walls from the last charge, and combustion takes place directly over the charge, by means of air admitted through the door. So the coking or driving out of the volatile matter and the cementation of the particles of coal into a coherent mass takes place from the top downward, with the production of the long finger-like pieces typical of the beehive coke. A small portion of the fixed carbon of the coal is usually consumed along with the volatile matter and in low volatile coals like the Pocahontas this amounts to a very considerable percentage of the whole. The products of combustion pass out of the charging hole as smoke and flame, producing the familiar "pillar of cloud" by day and "pillar of fire" by night that distinguishes every beehive coking district in the country. After the coking process has continued for 48 or 72 hours, the coke is quenched by watering it while in the oven. This quenching away from the air preserves the bright lustre, typical of the beehive coke, and which was formerly thought by many to be a point of great superiority over retort oven coke. When cool, the coke is drawn from the oven by hooks and loaded on cars. The usual yield of coke from the 6 tons of coal charged is 60 to 65 percent and the time consumed in coking is 48 hours; so that the average output of a beehive oven is from 1½ to 2 tons of coke per day. Foundry coke is kept in the oven 72 hours, in order to produce a harder structure.

The retort oven is constructed and operated on an entirely different basis. In this oven the coking chamber is long and narrow, having about the following dimensions: length, 30 to 40 ft.; height, 6 to 9 ft.; and width, 16 to 20 in.—all these dimensions depending on the type of oven and the kind of coal to be coked. Air is excluded as completely as possible from the chamber, so as to prevent any combustion of the coal, and

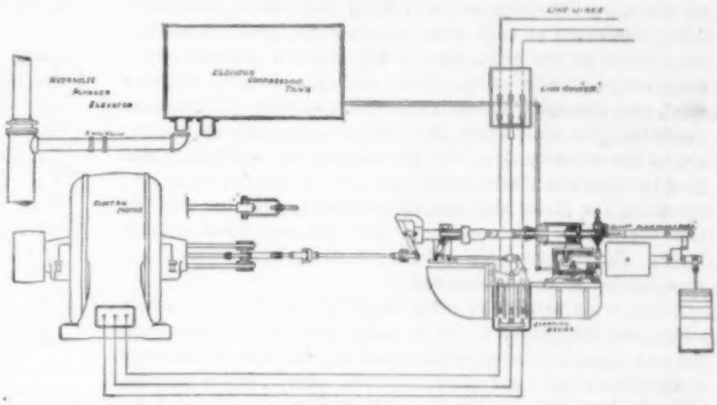


FIG. 2.—DIAGRAM OF ELECTRIC CONNECTIONS AND SECTIONAL VIEWS OF STARTING DEVICE.

the heat required for the coking process is generated by burning gas in flues contained in the walls of the chamber, the heat passing through the brick into the coal. The ovens may be arranged to recover the by-products or not. Where the available coal contains only small percentages of by-products, or where market conditions are adverse, the recovery may not be profitable; in which case the gases produced from the distillation may be led directly from the coking chamber into the heating flues and burned. The advantage of the retort oven is that it will coke many coals that cannot be coked in a beehive oven, like the 16 percent volatile coals of Belgium, or, as in the case of Pocahontas coal, where a yield of over 80 percent of coke is obtained, instead of the beehive's 60 percent on account of there being no combustion of the fixed carbon during coking. This is an increase of one-third, you will note.

Two Leading Retort Systems.

The two most prominent systems of restort ovens with saving of by-products are the Otto oven, with vertical heating flues, originally developed in Germany, and the Semet-Solvay oven, with horizontal flues, invented and developed in Belgium and France. Both have been greatly improved in capacity and economy of operation in this country.

In the Otto oven the gas was formerly applied alternately

* From a paper read at a recent meeting of the Western Society of Engineers at Chicago. Mr. Blauvelt is with the Semet-Solvay Co., of Syracuse, N. Y.

at the ends of these bottom flues, where it met the hot air from the regenerators below; the flame passing up one-half of the vertical flues, down the other half and out to the regenerator, and to the stack. Every hour the currents of gas, air and flame were reversed. But this method did not give perfectly even heating, certain portions of the oven walls would be too cold, while others were overheated. To correct this, the Otto-Hilgenstock oven was devised and developed in Germany by Dr. C. Otto & Co., the leading oven builders there. Rows of vertical burners were introduced under the heating flues, so that the temperature of any portion of the oven chamber could be controlled. No regenerators are employed, it being held that they complicate the ovens and are not necessary. Dr. F. Schniewind has still further improved the vertical flue oven, and as a result of his study an efficient solution of many of the problems connected with successful heating of vertical flue ovens, and excellent results have been obtained from this design in practical work. In this construction, the oven structure is supported on walls or beams, making it entirely accessible; the gas is admitted in burners under the oven flues and also at the end of the main flue. The air is preheated in regenerators by an improved application of the old Otto system.

In the Semet-Solvay oven there are four (or sometimes five) horizontal flues forming the sides of the coking chamber. Gas is admitted to the ends of three of the four flues and meets the hot air from the recuperators below. The flame travels along the entire series of flues, from above downward, being reinforced at each point of gas supply until it reaches the bottom of the oven, thus giving absolute control of the temperature at any point. There the two currents of gases meet, pass through a series of channels with thin walls, thereby preheating the air for the combustion of the gas above, and out to the chimney flue. On the way to the stack the gases pass through water tube boilers to raise part of the steam for operating the plant, although the temperature of the flue before the boilers is not above a dull red, and often entirely black. Nevertheless, the volume of the gases is large and considerable steam is obtained.

There are a number of other kinds of by-product or retort ovens, but they differ in detail rather than in principle from the two types just mentioned. And the method of operation is essentially the same in all. I shall describe more particularly the operation of the Semet-Solvay type, as it is these ovens which are now being built on the Calumet River in the Southern part of this city.

The ovens are built in blocks, usually of 30 or 40, with a set of boilers between each two blocks for absorbing the waste heat from the gases on their way to the stack. The individual ovens are 35 ft. long, 16½ in. wide and 7½ ft. high, and will hold seven tons of coal. Sometimes they have a capacity of nine tons. With ordinary coal, they will coke a charge in 24 hours or somewhat less. The coal is charged by means of an electrically operated car on the top of the ovens, through holes in the roof, and the top of the coal is levelled off by a machine at one end, so as to provide a free passage for the gasses from the coal. At many plants, this levelling is done by hand, rather a heavy piece of work.

The Process of Stamping.

In a number of European coke plants where the available coal did not produce a coke of sufficient density or strength, it has been the practice for some time to compress the coal by stamping it into a cake before charging it into the oven. The process is as follows: The coal is ground to the size of rice and moistened so that it will cake slightly when compressed in the hand. It is then fed into a box somewhat narrower than the oven, and stamped layer by layer by means of two or more stamps travelling back and forth in the box. In some plants the box moves back and forth, the stamps being in a stationary carriage. When the box is full, the coal has been compressed in volume about 25 percent. The box is run on to a transfer car attached to or part of the pusher and taken to the oven to be charged. The pusher, which is used for discharging the coke from the oven, is a heavy ram, with a beam somewhat longer than the oven, arranged on a carriage and actuated by an engine or motor. The doors at each end of the oven are opened (they are usually lifted out of the way by hydraulic or electric power), and the charge of coke is pushed out, like a great red hot bar, which tumbles to pieces as it falls into the quenching car and is quenched by a heavy stream of water. As soon as the pusher ram has been withdrawn, the box containing the stamped cake of coal is brought in front of the empty oven, and the sides of the box drawn back so as to free the cake. Then the cake is pushed into the oven, carried by the peel or bottom of the box, which is movable, actuated by a rack on the bottom and a motor driven pinion. As soon as the cake is in the oven, the door is closed and the peel is withdrawn.

The stamping of the coal prevents the formation of the spongy coke produced by many coals and improves the physical structure, as well. It is not adapted to all coals, however, at least it is the opinion of some furnacemen that when employed on coals which naturally produce dense cokes, the grain is made too close. A few installations have been made in this country but the practice has not yet been generally adopted here.

The coal having been charged into the oven, either from the electric larry or from the stamping box, the oven is tightly closed, the doors sealed with clay and the coking begins. The whole operation of discharging the coke, charging the coal and sealing up the oven is a short one, occupies not over fifteen minutes. The coking process occupies from 18 to 36 hours, depending on the coal and the width of the oven. In the Solvay ovens the usual time is rather less than 24 hours. Various coals are most effectively coked by higher or lower heats or longer or shorter periods of coking. Sometimes a mixture of coals gives the best coke, and again a fine grinding of the coal is necessary to produce a good texture.

Treatment of Volatile Products.

Taking up now the treatment of the volatile matter driven off by the coking process, for the recovery of the by-products, we find that it comes off from the coal in the form of a gas mainly methane and hydrogen at first and of a yellow or brown color, heavy with watery and tarry vapors. The composition of the gas changes as the distillation proceeds, the methane becoming less and the hydrogen and carbonic oxide increasing while the tar vapor decreases in quantity and becomes of lighter quality. This gas is led through an opening in the top of the oven into a hydraulic main, a large reservoir or pipe extending the length of the block and conecting with all the ovens, so as to equalize the pressure of the gas in them all. The gas bubbles through water under a toothed diaphragm in the main, thus washing out the soot and heavier tars and then passes over to the by-product building where it is cooled, scrubbed and separated from the tar and ammonia it carries, together with any other by-products that it is desired to remove, such as benzol, cyanides, etc. These processes are esentially like those of the ordinary coal gas plant and do not need special description here. Where the more refined products are made, of course, the apparatus becomes more complicated and a higher degree of chemical skill is required.

Marketing the Coal Tar Products.

The problem of marketing the by-products is an important one and requires great familiarity with the arts and manufactures into which the by-products enter, since it is only by the preservation of these markets and the maintenance of fair prices for the products that continued growth of the by-product oven can be possible. A most conservative policy is essential to the industry. This is especially the case on account of the peculiar conditions surrounding the tar market.

There are great fluctuations in the supply of and demand for tar. In case of an oversupply there is no recourse but the burning of the surplus as fuel, from which the returns are, of course, merely nominal; moreover, there are relatively few industries in which tar can be disposed of in large quantities. Crude coal tar, as produced in gas works and by-product ovens, is separated by distillation into pitch and oil, the pitch comprising from 60 to 70 percent of the tar. The oil contains or is the source of a multitude of "coal tar products," the principal ones being anthracene, creosote oil, naphthalene, carbolic acid and benzol, and their homologues. The development of this and the other finer products has hardly been begun in this country. Their manufacture requires the highest chemical skill and considerable investment of capital. Color making, for instance, one of the great industries of Germany, and one in which every step has to be checked by able chemists, relies for its raw material on only a very small fraction of the total tar, and the same is true of nearly all the highly refined products. Carbolic acid is the base of picric acid or tri-nitro-phenol, which is the main ingredient in the latest high explosives, the English lyddite, the French mellinite, the Japanese shimose powder and our own maximite. Carbolic acid is, of course, used very largely as a disinfectant. The market for creosote oil is mainly to be looked for among users of lumber, and creosoting is growing in favor as our supply of lumber becomes more precious. The uses of naphthalene are familiar to you all, and the modern pharmacopœia calls largely on coal tar derivatives.

Domestic Development Slow.

Yet all these uses as so far developed in this country will not consume any important part of the country's production of tar or offer any material relief to the responsibilities of those interested in the development of the use of tar products. We must continue to look across the water for our supply of most of these articles until there have been many failures and much time and money spent in experimenting here. The backward position of this country in chemical industries does not promise a very rapid development of these difficult and complicated manufactures. Road making in the form of tar macadam offers promise of success and when developed will be an available tar consumer. City paving and the great roofing industry are dependent on tar products, but, notwithstanding their recent growth, their needs are already fully met. The manufacture of paint from coal tar is rapidly coming to the front, since thoroughly efficient paints having coal tar as their base have at last been developed, and the best of these paints are proving their superiority to mineral paints. But the supply of tar threatens to grow much more rapidly than the consumption and the great question to be met is really the consumption of pitch. The 60 or 70 percent of the total tar which is in the form of pitch has but very few uses. In Germany and generally throughout continental Europe enormous quantities of pitch are consumed in the briquetting industry. In this country, however, briquetting is only in its infancy, and its growth can hardly be rapid for many years to come on account of the very superior quality of our American fuels and the conditions of transportation which permit their wide distribution at low costs, all these conditions being contrary to those met with in continental Europe. A briquetting plant is about being started in Detroit, another in Scranton, and others will follow in other parts of the country as conditions justify them. There should be a place for briquettes, particularly in domestic use, and careful study is being given to the possibilities of this trade which offers very much the largest possibilities of pitch consumption.

The Market for Ammonia.

The by-product ovens are already the leading producers of ammonia in the country, and are making their crude product into the gas liquor of commerce, which forms the raw material for refined ammonia products, and also furnishes the supply for the manufacture of soda by the so-called ammonia process, which is the only process now largely used in this country. Coke oven ammonia is also being used for the manufacture of explosives and for the production of the refined aqua ammonia of commerce, which is largely consumed in refrigerating machines, either as aqua or in the form of anhydrous ammonia. Sulphate of ammonia, which forms the main product of the German coke ovens, is still being imported into this country, athough the production of sulphate from the by-product coke oven plants here is rapidly increasing. This form of ammonia is, of course, mainly consumed in the manufacture of fertilizers. The consumption of fertilizers is growing in this country, especially in the South, and it has been demonstrated many times in continental Europe, where the subject has been exhaustively studied, that sulphate of ammonia is the most available form of nitrogen for plant food that is on the market. Its main competitor is nitrate of soda, all of which is, of course, imported from South America. Slaughter house refuse is also a large source of ammonia, and fertilizers are largely made up of a mixture of the various nitrogen and phosphoric acid bearing substances in proportions necessary to meet the conditions of the crop or the land on which they are to be used. If there is a development of the fertilizer trade in this country approaching anywhere near the European requirements, there will always be a market for ammonia in the form of sulphate, but always at a lower return to the producer than from any other form of ammonia. The sulphate which is introduced into the fertilizer trade must of course, to some extent, at least, replace the nitrate of soda, the trade in which is strongly supported. A great deal of systematic and most highly organized propaganda has been necessary in Europe to develop the fertilizer trade to its present conditions, and to effect the same development here will unquestionably demand a prolonged and intelligent education of the agriculturists of the country.

The ammonia production of the country is worthy of a few statistics, although by-product ovens are only in the beginning of their full development, and notwithstanding the rapid growth of the manufacture of water gas in this country as compared with coal gas, formerly, practically the sole source of the ammonia supply of the country. In 1893 the latest year for which full statistics are available, the ammonia produced by the gas works and by-product oven plants was 79,800,000 lb., calculated as sulphate of ammonia, and was worth nearly 1¾ millions dollars. Besides this, 33,500,000 lb. of sulphate were imported, making a total of 113,300,000 lb. The figures for 1906 will leave these far behind, for the by-product oven plants that will be in full operation at the end of this year will themselves have a capacity of about 130 millions lb. of ammonia figured as sulphate, which is twice the entire production of the country as late as 1902.

Illuminating Gas.

Considerable attention has been attracted recently to the production of illuminating gas from by-product oven plants, and perhaps it may be well to point out one or two differences between the manufacture of this gas in the by-product oven and in the ordinary gas retort. The principal difference is in the quantity of gas produced per ton of coal consumed. In the gas retort, where the object is the maximum output of gas, the coal is coked in a thin layer, giving off the gas very quickly and the retorts are heated either by portion of the coke produced or by the firing of other solid fuel. But in the by-product oven a portion of the gas is used for heating the oven, so that the surplus remaining for sale is less than half of the total. In other respects, there is really no difference between the gas produced by the two processes. It is quite as easy to enrich one as the other, when they are made from coals low in illuminating power, so that for illuminating or fuel pur-

poses the gas may be commercially considered as being entirely similar to the familiar coal gas of our cities.

The production of benzol from coke ovens is not a new industry in Europe, as there has long been a considerable demand for it for various purposes. In this country, while it has been produced for some little time at several of the Semet-Solvay oven plants, it is only just beginning to be put on the market as an enricher for illuminating gas. Careful experimenting through a considerable period of time has demonstrated its great usefulness as an enricher and its special applicability to plants that are not using water gas apparatus and depend for their enrichment on expensive cannel coals or other coals producing high candle power gas. The extremely simple apparatus required and the absolute flexibility and control of the benzol make it an ideal enricher for many gas works.

By-Product Coke.

Let us now turn to the discussion of the main product of the by-product oven, viz., coke. Contrary to the understanding of many, a by-product coke oven plant, when properly managed, is always run primarily for the production of the best quality of coke that can be made from the coal; first, because the conditions which make the best coke are the best for the by-products, and second, because the market is not satisfied with anything but good coke. It has been demonstrated many times that from any given coal the by-product coke is quite as good in every respect as bee-hive coke, and the reason by-product coke has, in some cases, been criticised, and justly so, is that since retort ovens will make coke from many coals which cannot be satisfactorily coked in bee-hive ovens, inferior coals have frequently been used, and consequently a good deal of inferior coke has been produced. I have here some samples of bee-hive and by-product coke, both made from Connellsville coal. You will note, that although the appearance is different, yet the structure of the by-product coke is excellent. The form is somewhat blockier, and, generally speaking, it is more uniform in size than the bee-hive coke, an account of the tendency of the beehive process to produce long fingers; short blocky pieces are especially acceptable to the furnace men. The percentage of ash and phosphorus is always slightly less in the by-product coke, on account of there being less loss of the fixed carbon of the coal in the by-product oven.

When by-product ovens were first introduced into this country, there were many discussions and tests to determine the relative merits of by-product coke and bee-hive coke. This comparison has been made under so many conditions that advocates of the by-product oven are now rarely called upon to discuss the merits of by-product coke as such in comparison with the bee-hive. There are many records, for example, of by-product coke used in foundry work, which are available to any who may be interested, which show that the results obtained by the use of this coke through long periods are superior to any produced from the best bee-hive coke obtainable. Similar data may be readily obtained regarding the use of coke in blast furnace practice. All by-product coke is not as good as the best bee-hive, for the reason indicated in a previous paragraph, and there is still a large field open to the experimental department of the by-product coke oven work, looking to the production of first class by-product coke from inferior coals. This promises much success in many cases, and indicates an important field of possible usefulness for the retort oven, when we consider what a small part of our coal deposits are available for coke making in the bee-hive oven.

Future of the Industry.

That this relatively new industry has come to stay in this country cannot be questioned. The more than 3,000 ovens now in operation, or building, to say nothing of other installations still on paper, have a capacity of about 4,750,000 tons of coke per annum. The production of Pennsylvania, the great coke-producing state, for the year 1903, was 15,640,000 tons, while the entire production of the country was 25,200,000 tons. I have not available, as yet, the statistics for 1904, but they are not materially different. These figures show that already the by-product coke oven industry has a capacity of nearly one-fifth of the entire coke production of the country. Its future growth is dependent on the capacity of the country to absorb its by-products.

In 1893 the production of coke in this country was nine million tons. The first plant of 12 by-product ovens was built in that year. In 1903, as stated a moment ago, the coke production had grown to over 25,000,000 tons. Is it unreasonable to expect that in 1913 the production will be 37 or even 40 million tons? What share of this increase will fall to the by-product oven? Dr. C. Otto & Co., the leading representatives of the industry in Germany, have alone built 15,000 retort ovens and in 1903 they contracted for 2,337, nearly as many as have been erected in ten years in this country. But the by-product oven cannot have a healthy growth at any faster rate than is justified by the growth of the industries that consume the by-products. Since the introduction of the by-product oven in this country, it has been greatly improved; its output per unit of labor has increased more than three fold, its machinery has been adapted to American labor conditions, and its coke has established itself in American metallurgical practice. Very much remains to be done, and perhaps one of the most important fields of work is the successful coking of the widespread deposits of coals that have resisted the efforts of the bee-hive oven, which is so especially adapted to our famous Connellsville coal, now so rapidly nearing exhaustion. But secondary to none in the lines of work upon which the future of the industry depends, is the development of those other industries which must consume what the by-product oven produces. It will be very interesting to the student of the industrial progress of this country to note whether when once embarked on the development of chemical industry, the same success will be achieved and the same brilliant results attained as have made this country famous in mechanical engineering. The outcome will largely determine the future of the by-product oven.

Niles-Bement-Pond Co. Statement.

The Niles-Bement-Pond Co. has filed this statement of its condition Dec. 31 last with the Massachusetts Commissioner of Corporations:

Assets.

	1904.	1903.	Increase
Real estate and machinery..	$3,536,065	$3,617,025	*$180,960
Merchandise	1,310,222	1,392,711	*82,489
Cash and debts receivable...	2,158,968	2,152,582	6,386
Office fixtures	.....	4,347	*4,347
Investments	4,746,942	4,702,652	44,290
Other assets	25,983	.....	25,983
Total	$11,778,180	$11,869,317	*$91,137

Liabilities.

Capital stock	$7,000,000	$7,000,000	.....
Accounts payable	8,795	.....	$8,795
Ground rent	29,963	.....	29,963
Surplus	4,062,145	3,845,302	216,843
Profit and loss	257,274	553,999	*296,725
Total	$11,778,180	$11,869,317	*$91,137

* Decrease.

At a meeting of the stockholders of the Taylor Iron and Steel Co., of High Bridge, N .J., the following directors were elected: Lewis H. Taylor, Robert E. Jennings, Alexander C. Humphreys, Krox Taylor, Henry M. Howe, T. F. Budlong and Percival Chrystie. The directors elected the following officers for the ensuing year: President, Lewis H. Taylor; vice president, Robert E. Jennings; secretary and treasurer, T. F. Budlong; superintendent, Percival Chrystie.

CUTTING SHIELDS FOR HUDSON RIVER TUNNELS.

The Riter-Conley Mfg. Co., Pittsburg, has the contract for the construction of the four cutting shields to be used in digging the Pennsylvania Railroad tunnels under the Hudson River. As the tunnels will be worked from both the New York and New Jersey sides, four cutting shields are required Two have been completed and will shortly be shipped and the remaining two are still under construction. These shields are 24 ft. 6 in. in diameter and 16 ft. long, not including the roof, which overhangs 30 in. around two-thirds of the circumference to protect the workmen from cave-ins. The roof is only used when dangerous ground is struck and the cutting edge extends around the entire circumference of the shield. The weight of each of the shells is about 175 tons. The shield shells are made up of three thicknesses of steel plates, the inner and outer plates being ¾ in. thick, and the center one 5/8 in. thick. The butts all come out at different places in order to develop the maximum strength of the combined plates. At the butts there are six lines of closely spaced rivets, and the entire shells are stitched with countersunk rivets about 12 in. centers.

The cutting edge is reinforced with a heavy steel casting made in segments with machined bearings against the shell. Back of the steel casting there is a nest of brackets, which in addition to reinforcing the cutting edge,, act as a seat for the 24 hydraulic jacks that are spaced directly inside of the shell incased in steel pockets, which form a circular girder to further strengthen the shell, and inside of this rim there are horizontal and vertical girders, between which there are nine gates, two in the top tier, four in the center tier and three at the bottom. Immediately under the top and center tiers there are eight hydraulic rams which carry movable platforms.

In the operation of the shield the workmen enter the bottom tier of gates and cut away the earth, throwing it through the gates to tram cars. As soon as the earth is cut to sufficient height to allow the first platform to be moved out the men enter the second tier and cut away the earth until the second platform can be moved out. They then get within the upper tier and cut away the balance of the space, giving the shield a free space to advance about 3 ft.

The finished cast iron section of the tunnel are always put in place up to a point lapping inside of the shield, a distance of about 18 in., and when ready to advance the shield another space, the hydraulic jacks are thrust against the last set of cast iron linings, which pushes the shield forward and at the same time gives clearance for another set of linings. These are placed in position and the work of cutting away in front of the shield for another advance proceeds.

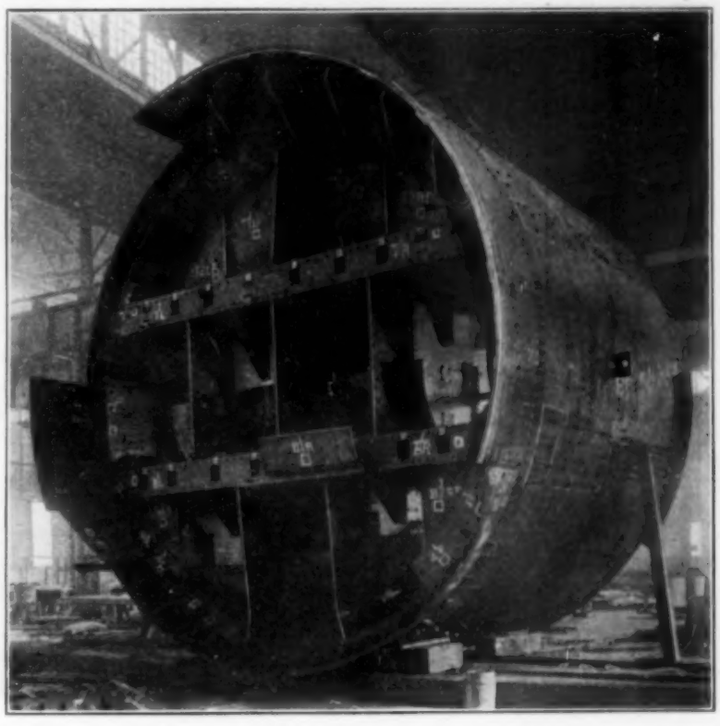


FIG. 1.—FRONT VIEW SHOWING ONE-THIRD OF CUTTING EDGE IN PLACE TOGETHER WITH PORTION OF ROOF TO PROTECT WORKMEN.

A press dispatch says that the municipality of Vienna will invite bids for early delivery of 100 electric-motor street cars and 100 trailer cars, the cost of which is estimated at $500,000. If Americans should be able to secure the contract for these cars, advises Consul-General Gunther, it would prove a prominent advertisement and no doubt procure many orders from other cities of the old world. He thinks manufacturers should have able representatives in European countries to look after our orders, and be fully prepared to submit bids and conclude contracts.

The Best Mfg. Co., Pittsburg, has obtained the contract for piping required for improvements being made on the plant of the Eastern Steel Co., Pottstown, Pa. The order, which amounts to $50,000, was awarded by the Garrett-Cromwell Engineering Co., Cleveland.

TRADE PUBLICATIONS.

A catalogue of special tools for repair shops comes from H. B. Underwood & Co., of Philadelphia. The catalogue has a halftone photograph of D. W. Pedrick, formerly of the Pedrick & Ayer Co. and now in charge of the department whose products are illustrated in the present publication. The catalogue shows portable boring bars for lathes, cylinders, etc., facing arms and spiders, taper attachments for boring bars, valve seat planers of portable type, crank pin turning machines, radius planer attachments, etc.

The business of the Curtis & Co. Mfg. Co., of St. Louis, in air compressors, pneumatic hoists and traveling cranes has increased rapidly in the past few years and 1904 is of record as the most prosperous in the company's history. The 1905 catalogue is but a selection of illustrations and tables. Circulars of separate machines are available on request for details. The firm has added to its compressors a 6 x 6 single cylinder and a full line of electrically driven compressors. The list of hoists made by this company has been broadened by some special designs and the line of cranes has been increased and improved. The elevators have been redesigned. These changes and a general view of a diversified product is the evident message of a pamphlet of considerable typographical merit.

The Ingersoll-Sergeant Drill Co., of New York, has in prospect a series of bulletins describing labor-saving tools operated by compressed air. These will be issued by the pneumatic tool department and will have a distinctive color and uniform typographical appearance. An advance copy is at hand and describes the Macdonald rivet forge. This operates by a jet of compressed air striking against the wings of the fan. The fan is made of aluminum and is well protected by the forge frame.

The Dewhurst slag cars and ladles are manufactured by the Wellman-Seaver-Morgan Co., of Cleveland. This firm is the sole American builder of these cars and manufactures them in side or end tipping types, in a variety of sizes. A complete description of the ladles and cars has recently appeared

in *The Iron Trade Review*. A neat circular describing the cars and ladles also has a list of some users in Great Britain and India and we learn that Bell Brothers, Ltd., of Middlesboro, for example have thirty of these cars in operation.

The Rockwell Engineering Co., of New York, has a special catalogue describing its double chamber melting furnace. The catalogue is in very neat style and fully illustrates the use of this furnace, showing the operation in detail, also the method of lining. A comparative statement shows the cost of operating the Rockwell furnace and the ordinary type of crucible furnace.

The latest catalogue of the Waterbury Brass Co., of Waterbury, Conn., details the stock of brass, copper, German silver, etc., carried "on call" at the Providence, R. I., and Waterbury warehouses. It is not easy to summarize the stock varieties of sheet, wire, rod, tubing, etc., in their several materials. Brass for example may be "common," i. e., for bending, stamping and plate work not requiring drilling or cutting, or it may clock or drill brass, drawing brass, spinning brass, brazing

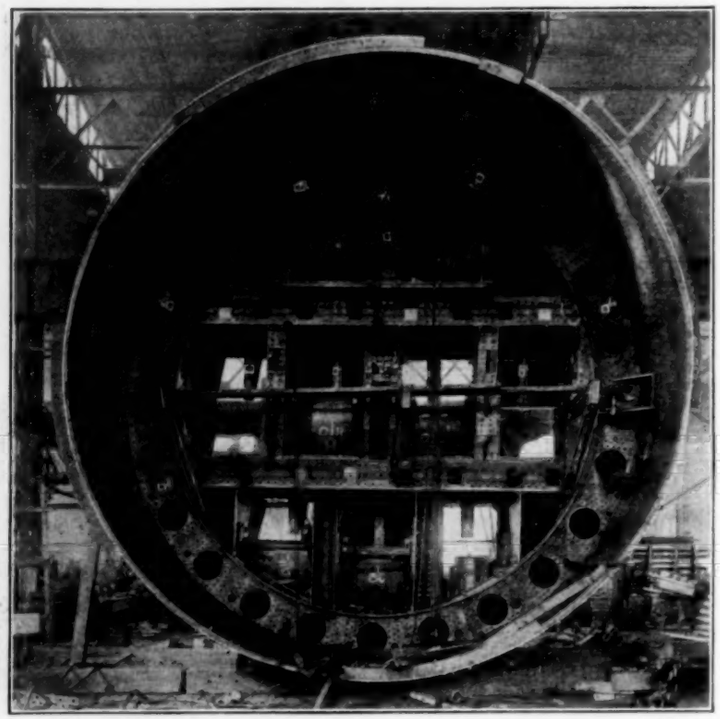


FIG. 2.—REAR VIEW SHOWING 24 POCKETS THROUGH WHICH HYDRAULIC JACKS OPERATE, ALSO POCKETS FOR HYDRAULIC RAMS.

brass, high brass and low brass. Then there are bronzes made rich in copper for coloring effects, also alloyed with tin for such wearing qualities as are specially suitable for bearings and durable spring action. Then there is the matter of temper: quarter hard, half hard, regular hard, spring, extra spring, bending temper and cold rolled. And then, too, there are anneals: light anneal, medium anneal, regular soft anneal and dead soft anneal. Lastly there is the gauging: Brown & Sharpe, Stubs, Birmingham wire gauge and English standard. More than half of the catalogue is reserved for tables of weights of metal (sheet, rod, tubing and wire) and rules which will be useful in estimating. Among these a very complete discount table clearing up the intricacies of the fractional percentages common in the metal trading world. The catalogue is indeed a convenient compilation.

"Common Sense and Mathematics" is the title of a booklet from the Lucas Machine Tool Co., of Cleveland. This discusses the shop problem of production and the merit of the "Precision" boring, drilling and milling machine in the direction of a satisfactory solution. Incidentally evidence is presented that the reciprocal of 2 is "sometimes" less than ½, as for example: "When boring is done in a lathe or similar machine, and the work is fed for the cut, the boring bar must be twice as long between supports, and will spring more than twice as much, and the work therefore cannot be bored half as fast as in a "Precision" machine, in which the boring bar is fed for the cut."

A rivet forge and contents going to smash with a vigorous kick is the cover design of a pamphlet on "Upsetting Rivets." This publication is sent by John F. Allen, of New York, and contains a series of testimonials to the efficiency of the riveting machines made by this manufacturer.

An attractively arranged folder exploits the 53-in. boring and turning mill built by the Colburn Machine Tool Co., of Franklin, Pa. The firm manufactures mills in the following sizes: 34, 44, 53, 60, 65 and 72-in. The 53-in. machine is illustrated and described in Bulletin No. 20.

A loose leaf binder with a number of interesting sheets come from the mine and industrial department of the R. D. Nuttball Co., of Pittsburg. This firm manufactures gears, pinions, trolleys, trolley poles, trolley harps and wheels for mine and industrial haulage systems and supplies cut or planed gearing from the smallest to 30-ft. diameter. There are tables of gear data in clearly arranged style incorporated in the present publication which we understand is but a preliminary step toward a new and complete catalogue at a more convenient season.

As steam temperatures and pressures have increased, the earlier forms of flange gaskets have become less and less efficient, necessitating continual improvements to meet the severity of modern requirements. The advantages of asbestos for this purpose are discussed in a pamphlet "Flange Joint Gaskets" issued by the H. W. Johns-Manville Co., of New York. The pamphlet is well printed and illustrated and contains a list of sizes and prices.

The Fischer Foundry & Machine Co., of Pittsburg, attempts in its latest catalogue to illustrate only a limited number of the machines built. In most instances but one machine of each type is shown. In the case of rolling mills, the roller tables, manipulators, transfers, etc., are omitted in order to show the construction of the mill proper to greater advantage. It may here be mentioned that the firm is prepared to build special machinery for any purpose and also supplies castings of either gray iron, air furnace iron, cast steel or bronze. Equipment for rolling mills, steel works, tube mills, boiler shops and bridge works is excellently depicted in the catalogue.

The inventory of the estate of William Sellers, who founded the corporation of Sellers & Co., machine tool manufacturers, Philadelphia, was filed a few days ago, and showed that the estate is valued at $2,470,469.76. The principal effects include shares in the Midvale Steel Co., the Sellers Co., the New Jersey, Hudson River Railway & Ferry Co., the Ardmore & Llanerch Railway, the Millbourne Mills Co., Trenton & New Brunswick Railroad, Tonopah Mining Co., and the Philadelphia & West Chester Traction Co.

The King-Lawson Car Co., Middletown, Pa., has elected the following officers: Thomas Lawson, of New York, president and general manager; Theodore Thomas, of New York, vice president; Arthur King, of Middletown, treasurer, and Paul A. Kunkel, of Harrisburg, secretary. The company will put on the market the newly patented King-Lawson dump car, operated by compressed air.

PERSONAL.

C. E. Langdon, of Minneapolis, has been elected assistant secretary of the Twin City Foundry Association.

W. C. Ruckman, who has been associated with the George Challoner Sons Co., Oshkosh, Wis., founder and manufacturer of saw mill machinery, for the past fourteen years, has sold his interests in that city and has become the secretary and treasurer of the Challoner-Perkins Co., of Seattle, Wash.

Fred Lavis has resigned his position with Westinghouse, Church, Kerr & Co. to accept an appointment as resident engineer with the New York, Westchester & Boston Railroad, with headquarters at Mt. Vernon, N. Y.

Albert Patton has been appointed assistant superintendent of the Bessemer plant of the Republic Iron & Steel Co., at Youngstown. Mr. Patton recently went to Youngstown from Buffalo. Prior to that he was employed at the Ohio works of the Carnegie Steel Co.

E. B. Boyé, who for five years has been connected with the Chicago office of Manning, Maxwell & Moore, has been appointed Cleveland representative of that firm. The company feels that in placing Mr. Boyé in the Cleveland office it has selected a man who has the qualifications of business experience and gentlemanly character that will appeal to the people of the locality most favorably.

Frank M. Eaton, manager of the Cincinnati office of Hickman, Williams & Co., has gone west on a vacation of several months. Mr. Eaton was run down in health and has left his office on the advice of his physicians.

Wm. Lodge, of the Lodge & Shipley Machine Tool Co., Cincinnati, will leave about April 1 for the Azores and expects to be gone for at least a month.

C. H. DeLano, a well known advertising man of Chicago, has been appointed manager of the advertising department of the Buda Foundry & Mfg. Co., Harvey, Ill., with offices in the Railway Exchange building.

W. L. Chandler, Cincinnati manager of the Dodge Mfg. Co., has been appointed assistant sales manager, and will have his headquarters in the general offices of the company at Mishawaka, Ind. W. E. Galway succeeds Mr. Chandler in charge of the Cincinnati office.

O. P. Letchworth, president of the Pratt & Letchworth Co., Buffalo, sails on Saturday, March 25, on the Princess Irene of the North German Lloyd line, for a two months' stay in Europe.

J. H. Patterson, president of the National Cash Register Co., Dayton, O., who went on a tour around the world last year, is now in Japan, and is expected to return to the United States early in the coming summer.

Nevin McConnell, general superintendent of the Donora plant of the Carnegie Steel Co., Pittsburg, has tendered his resignation to take effect April 1. Mr. McConnell goes to the Pasaic Steel Co., Paterson, N. J., in the capacity of first vice president and general manager. On Saturday, March 18, he was tendered a banquet by the Carnegie officials which was attended by about 100 department heads. H. J. Davis, assistant general superintendent at Homestead, will succeed Mr. McConnell.

Albert Patton has been appointed assistant superintendent of the Bessemer plant of the Republic Iron & Steel Co., Youngstown, O.

M. V. S. Wilson, formerly connected with the American Sheet & Tin Plate Co., Pittsburg, has been appointed general manager of the Portsmouth Steel Co., Portsmouth, O.

John C. Greenway, superintendent at Ishpeming, Mich., of mines of the Oliver Iron Mining Co., in the Marquette district, has been appointed general superintendent of a new group of mines on the Western Mesabi, of which he will take charge about the middle of the coming summer.

A. E. Goodhue, manager of the St. Paul, Minn. office of the United States Cast Iron Pipe & Foundry Co., will sever his connection with that company April 1, to enter the service of the Midvale Steel Co., New York City.

Frank C. Osborn, president of the Osborn Engineering Co., Cleveland, will deliver the address to the graduating class of the Rensselaer Polytechnic Institute at commencement on June 14.

Obituary.

Marriott McKinny, who for more than fifty years was a manufacturer of iron fences, died at his home, Brooklyn, N. Y., March 8. He was in his eighty-fourth year.

George Huey, pioneer ironmaker of Western Pennsylvania, died March 8, at his home near Connellsville, Pa.

Thomas C. Perrine, 67 years old, died at the home of his daughter in Weston, W. Va., March 8. He was secretary of the Broomall Iron & Steel Co., of Bellington, W. Va.

Sidney P. Johnston, Chicago, editor of the *American Artisan* of that city, died on March 19. He was a well known chess player, having participated in the cable international matches several years ago.

Frank A. Wilson, secretary of the Boston Labor Bureau and the New England Iron League, died on March 15, after an illness of a few days.

Moses Atwood, aged 57 years, vice president and general manager of the Pittsburg Valve, Foundry & Construction Co., Pittsburg, died at his home in Allegheny, on Friday, March 17, after a long illness. Deceased was born in Pittsburg and early in life was appointed auditor of the Panhandle Railroad with headquarters at Columbus, O. About 23 years ago he resigned and became junior partner of Atwood, McCaffrey, Pittsburg, with works on Third avenue, manufacturers of valves and fittings. In 1900 this company was one of the concerns that was absorbed by the Pittsburg Valve, Foundry & Construction Co., and he was appointed secretary and general sales agent, and two years later became vice president and general manager. He is survived by his widow and two sons.

The Inland Steel Co., Chicago, is making preparations to start its sheet mill at Indiana Harbor, Ind. within a few days. This plant was shut down last summer when the workmen went on strike and has been idle ever since. The repairs and changes that have been in progress for some months past are now completed, and the mill is being put into shape for an early running on the open shop plan.

The Republic Iron & Steel Co. has moved its general offices at Chicago from the 15th to the 16th floor of the Railway Exchange Bldg.

The American Ship Building Co. has closed a contract for another big freighter for 1906 delivery. The order was placed by Captain Charles L. Hutchinson, of Cleveland, Joseph G. Butler Jr., of Youngstown, and others. The boat will have a carrying capacity of 10,000 tons.

The Otis Elevator Co. has declared the regular quarterly dividend of 1½ percent on the preferred stock and the usual dividend of 2 percent on the common stock, payable April 15 to stockholders of record March 31.

The parts of the iron statue "Vulcan," which represented the Birmingham district and Alabama at the St. Louis Exposition, have been shipped, and it is expected that the entire statue will soon be placed in position in Birmingham.

Judge Kohlsaat, of the United States district court, Chicago, has appointed the Royal Trust Co. receiver of the Barton & Maas Foundry Co., a large concern at Nineteenth & Rockwell streets, Chicago. The appointment was made on petition of the C. A. Stevenson Pig Iron & Coke Co.

THE IRON TRADE REVIEW

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MARCH 23, 1905

POINTS IN THE STEEL CORPORATION'S REPORT.

The report of the United States Steel Corporation for the year ending Dec. 31, 1904, as published within the week, has been anticipated as to its main financial features by the quarterly statements. Yet with all the scrutiny given the latter, as they have appeared in the past year, there is important information which the new annual report makes public for the first time, and comparisons with 1903 become of interest.

What was most impressive in the first two annual reports was the statement of amounts expended for maintenance and repairs, for extraordinary replacements, and, in the third place, for construction and additional property. The size of these three classes of expenditures gave some idea of the colossal proportions of the Steel Corporation and at the same time indicated what enormous outlays are required in iron and steel manufacture for the modernization of plant, for keeping pace with improvements in methods and appliances, and for providing the most efficient instruments of production in every department, from iron mining and ore handling to the rolling of the smallest product of the mill. The latest report only confirms this view. But the voluminous statistical statement also indicates that distinct progress has been made toward a uniformly good physical condition of the vast properties of the Corporation, and that a rigidly conservative policy has been followed in the accounting pertaining to improvements. Only new construction and newly acquired property are charged to capital account, and all replacements of and improvements to existing property come from current earnings, even though, as the report says, such replacements "more than replace and actually increase the production or operating capacity and reduce costs."

It is of interest in this connection to set down the amounts expended in the three classes of improvement and new property items in the past three years—namely: 1, ordinary maintenance and repairs; 2, extraordinary replacements; 3, construction and additional property. They are shown in the following:

	1904.	1903.	1902.	9 months in 1901.
Ord. maint. & rep.	$18,155,498.43	$21,845,413.38	$21,230,218.13	.....
Extraord. replacements	8,102,873.79	12,939,777.83	7,926,792.60	.....
Capital exp'd., add'l prop.	17,957,946.17	31,042,135.97	16,586,531.77	$16,956,868.63
	$44,216,318.39	$65,827,327.18	$45,743,542.50	

It will be seen that from the formation of the Steel Corporation to the end of 1904, a period of three years and nine months, the total charge to capital account for construction and additional property has been $82,543,482.54, this amount including (chiefly in the $31,042,135.97 total of 1903) $10,004,238.03 expended since Dec. 1, 1902, for completing the furnaces, steel works and mills of the Union Steel Co. at Donora and Sharon, and in developing its coal, coke and transportation properties. The report for the nine months of the Corporation's operations in 1901 does not indicate separately the amounts expended in ordinary maintenance and repair and in extraordinary replacements, but for the past three years these items have totaled no less than $90,200,574.16. Thus more than $172,000,000 has gone into repairs, replacements, new construction and new ore, coal, coke and transportation property since April 1, 1901, besides the amount expended under the first two heads in 1901.

The prediction was made by many critics, early in the Corporation's history, that being an "integrated" concern its costs could only be reduced by a small percentage in times of low prices and slack demand, and therefore its profits would fall to but a fraction of those in the boom time in which it was launched. The past year's experience has refuted this view, as it has disposed of other predictions, based on partial knowledge. At $73,000,000 the net earnings last year were more than two-thirds those in 1903, though prices and domestic tonnage fell off in a markedd way from the preceding year.

That $10,000,000 was set aside in 1903 from net earnings for construction and improvements and no such allowance was made in 1904 has been commented on in some reviews of the report. The policy of the Corporation is evidently to set aside liberally on this account in years of large earnings, so that in leaner years such allowances may be reduced without passing the limits of safe financing. The funding of outlays on capital account, which was contemplated in the bond conversion scheme of 1903, is still uncompleted. At present there is a balance of outlays for construction and new property and for discharge of capital obligations, taken from surplus, amounting to $39,170,385.30. Against this there may be sold the $30,000,000 of 10-60 year 5 percent bonds still in the treasury of the Corporation, and $3,874,000 of Union Steel Co. mortgage bonds, that may be issued at the option of that company. The sale of these bonds would increase the cash item in the Corporation's surplus account to nearly $94,000,000 or close to the $100,000,000 aimed at. In this connection it can be ap-

preciated that had the $48,268,064.50 paid out in dividends on the common stock, been retained in the treasury the large improvement programs under contemplation in the future would present no difficulties. Sufficient intimation is given of the conservative policy that will be followed hereafter in the matter of dividends, in the statement that unexpended appropriations for work to be done in 1905 amount to $31,000,000. Only recently very considerable additions to this program have been under consideration.

While the undivided surplus on Dec. 31, 1904, was $61,365,445.69 against $66,096,682.36 one year previous, the cash item in current assets had increased from $50,199,660.91 on Dec. 31, 1903, to $60,646,426.94 on Dec. 31, 1904. It is to be noticed also that the balances to the credit of sinking, depreciation, replacement and improvement funds were not only greater at the end of 1904, but exist in more tangible form and more distinctly separated from current assets than heretofore.

The statement of production permits of comparisons on only a few items, with the production in the entire country, the statistics of finished material output in 1904 for all producers being not yet available. We compile the following, showing the percentages of the Corporation on four items for 1904 and the three preceding years:

Steel Corporation's Output, with Percentages of Total for United States.

	Gross Tons	Percent of Total	Percent in 1903	Percent in 1902	Percent in 1901
Pig iron	7,369,421	44.7	40.4	44.7	42.9
Bessemer ingots	5,427,979	69.0	72.0	73.9	70.2
Open-hearth ingots	2,978,399	50.4	51.0	52.4	59.0
Bess. steel rails	1,242,646	59.6	65.6	65.4	59.9

It does not appear that the steel monopoly often alleged has any existence or is likely to have. Besides showing a reduction in its percentage of both Bessemer and open-hearth steel last year, the Corporation marketed abroad 1,021,672 tons of billets and finished materials, as against a small tonnage in 1903, so that its proportion of the home business was less than in other years. The reduction in number of employes was from 167,709 in 1903 to 147,343 in 1904, and in wages and salaries from $120,763,896 to $99,778,276. Iron mining shows a sharp reduction, or from 13,768 employes in 1903 to 8,477 in 1904.

As an epitome of a critical year in iron and steel manufacture in the United States the report is full of interest and is therefore given large space in this issue. Both in its financial and operating exhibits it gives proof of the seasoning process that has been transforming the Steel Corporation into a workable thing, capable of direction, and commanding the highest order of talent for the working out of its problems. One of the foremost of these is that which deals with the vast outlays of money constantly urged by an operating department which has its eyes steadily on tonnage and production costs, straining to increase the former and decrease the latter. In no other industry is the factor of change, directed by the ambitions of the engineering staff, so prominent. To preserve the proper equilibrium between this side of such a great organization and that which stands for the earning and distributing of dividends, is the Steel Corporation's problem of problems. To its solution the past year has made an important contribution.

Strike at Wheeling Mills.

(Special Telegram.)

PITTSBURG, March 22.—A strike has been officially declared at the Whittaker-Glessner Co. plants at Wheeling by the Amalgamated Association. The mills did not start non-union today, on account of high water, but when the flood subsides they will be operated.

Electric Drive for Light Rail Mills.

Two of the light rail rolling mills at the Edgar Thomson steel works of the Carnegie Steel Co., Pittsburg, are to be motor driven. A contract for two 1,500-h. p. motors has been placed with the Westinghouse Electric & Mfg. Co. and the operation of these mills by electric power will be watched with great interest. Few rolling mills in this country are now operated by electric drive, although the practice is very common in Germany.

Fred Holz, the president of the Cincinnati Milling Machine Co., having desired to retire from active service has resigned his position, disposing of part of his holdings to Fred A. Geier. The company has been reorganized, the stock being distributed among the active workers of the concern. The new officers of the company are: Fred A. Geier, president; C. Wood Walter, secretary; G. A. Mayer, treasurer. The above together with E. M. Chace and P. O. Geier, are the present board of directors. The company is enjoying a fine business and is making further extensions to its plant.

Negotiations have been closed for the sale of a majority of the shares of the stock of the Hartford Machine Screw Co., Hartford, Conn., and of the Western Automatic Screw Co., of Elyria, O. The stock was bought by Edwin B. Cadwell, of Detroit, Mich., through Blair & Co., of New York for the Standard Screw Co. The price paid for the stock is equal to $1000 a share for the Hartford Machine Screw Co. shares and $300 a share for the stock of the Western Automatic Screw Co. For a number of years the Hartford company has paid a dividend of 10 percent a month, on a capital of $100,000 and the Western company 18 percent annually on $300,000 capital.

Recently the night turn on the 140-inch plate mill of the Carnegie Steel Co., Homestead, Pa., rolled 449 tons of plates which breaks all previous records on this mill.

The Amsler Engineering Co., Pittsburg, has been awarded the contract for the erection of the sheet, pair and annealing furnaces to be installed in the tin plate mill of the Atlanta Rolling Mill & Tin Plate Co., Atlanta, Ind. The four sheet furnaces will be 8 x 8 feet, and the pair furnaces will be 7 x 8 feet. The annealing furnace will be 16 x 20 feet. The Atlanta Rolling Mill & Tin Plate Co. has four hot and four cold mills with room for two additional. As soon as the furnaces are installed the plant will be placed in operation.

Only one bid was received by the Cincinnati Waterworks Commissioners March 17 for almost $500,000 worth of cast iron pipe and special castings for the coagulating basins, filters and clear-water reservoirs. This was from the United States Cast Iron Pipe & Foundry Co. for 12,278 tons of pipe and castings, sockets, flanges and spigots. The bid aggregated $413,568, which was over $8,000 less than the estimate of Acting Chief Engineer Benzenberg, $421,800. The company bid $27.90 for a lot of the pipe, but offered to reduce this to $25.90 a ton on condition that it got the contract for everything. This reduction amounted to $14,216.

The Labor Situation.

SEVENTH ANNUAL CONVENTIOM N. M. T. A.

The National Metal Trades Association will hold its seventh annual convention at the Auditorium Hotel, Chicago, on March 23 and 24. It will be preceded by the dinner of the alumni and the active members of the administrative council, who were scheduled to meet in Chicago on Wednesday. The following program has been arranged:

THURSDAY, MARCH 23.

Morning Session.

10 A. M.:

1. Call to order.
2. Address of welcome by Hon. Carter H. Harrison, Mayor.
3. Roll call.
4. Reading of minutes.
5. Selection of committees. *a.* Nominating committee for 1905-06. *b.* Auditing committee. *c.* Committee on ways and means. *d* Committee on wages and hours. *e.* Committee on strikes and lockouts. *f.* Committee on constitutional amendments. *g.* Committee on convention.
6. Call for resolutions.

11 A. M.:

7. Report of H. N. Covell, president.
8. Report of F. A. Geier, treasurer.
9. Report of W. P. Eagan, commissioner.
10. Report of Robert Wuest, secretary.

Recess.

Afternoon Session.

2 P M.:

11. Reports of standing committees. *a.* Finance committee. *b.* Plan and scope committee. This report, which has been printed and placed in the hands of the members, deals with the question of the relations between the National Metal Trades Association and the several local organizations.

Adjournment.

12. At 7 p. m. an informal dinner will be tendered the members of the National Metal Trades Association by the members of the twelfth district, in the banquet room of the Auditorium Hotel.

FRIDAY, MARCH 24.

Morning Session.

9 A. M.:

13. Paper on "Superintendents' and Foremen's Club," by F. S. North, of the Union Special Machine Co., of Chicago.

Discussion.

9:30 A. M.:

14. "Development in Opposing Evils in Trades Unionism," by J. Kirby Jr., of the Dayton Mfg. Co., Dayton, O.

10 A. M.:

15. Further consideration of plan and scope of organization.

Recess.

Afternoon Session.

2 P. M.:

16. Consideration of and action upon the question of hours.

5 P. M.

17. Reports of convention committees.
18. Report of nominating committee.
19. Election of officers.

Adjournment.

CHICAGO EMPLOYERS' ASSOCIATION.

The methods of Chicago employers in dealing with trade unions are shown in the annual report of Frederick W. Job, secretary of the Chicago Employers' Association. The spirit of co-operation has been manifested and the employers' organization has grown rapidly. Its efforts have been directed toward a more stable condition of affairs, and it has shown to independent workingmen that they will be protected in their independence. More than 3,000 wage earners who were once in danger of life and limb because they disliked labor organizations and their methods have been taken care of. It has been proved to the working people of Chicago that a union card is not necessary to secure work. In the membership in the association, the secretary's report shows a large growth. The number of individual concerns affiliated with the Employers' Association is upward of 3,000, as against about half that number a year ago. The original number of members in the association at the start, two years ago, was but twenty-two.

In the matter of organization, the secretary's report shows that eighty-two associations were addressed personally by the secretary during the last year in Chicago. Twenty citizens' alliances or employers' associations were organized by Secretary Job in other cities. Between 300 and 400 associations throughout the United States and outside of the association were assisted personally and by correspondence by the secretary during the last year. An important feature of the work done by Secretary Job was the assistance rendered through co-operation with other organizations before the House and Senate labor committees at Washington and the House judiciary committee during the last year urging the defeat of the anti-injunction, anti-conspiracy bill before the House judiciary committee and opposing the passage of the eight-hour law before the House and Senate labor committees.

The free employment bureau of the Chicago Employers' Association for the first eight months of its existence has had a total of 5,400 applications from men and women for positions, as follows:

Total number of applications for help from employers has been	3,064
The total percentage of applications for work represented by applications for help is	57%
The average number of applicants for work per month has been	663
The average number of applicants for work per day has been	26
References of each applicant are carefully investigated, and of the total number of references received the average of those that are good is	87%
The average percentage of poor references returned is	13%

Patronage of the bureau by employers has increased in a satisfactory manner. As a result of extensive distribution of circulars, in which idle men and women are informed that the employment bureau is really a free employment bureau, and that no charge is made them, the number of applicants for positions is steadily increasing. A noticeable increase in the number of applications by union employes and ex-union employes is perceptible. The average cost of the bureau per applicant during the last year has been 42 cents, as against the 62 cents which it costs the state per applicant to run its three free employment bureaus.

LABOR NOTES.

Preparations are now being made to place the Girard, O., plant of the Carnegie Steel Co. in operation in the near future. The plant was shut down several months ago on account of a strike, but as the company has more men than it can use at Youngstown, where a strike is also on, it has been decided to operate the Girard mill. A meeting of the strikers at Youngstown, O., was held this week and was addressed by officials of the Amalgamated Association. No steps were taken looking toward declaring off the strike and no final settlement will be made until after the annual convention which will be held in Wheeling. At Wheeling, W. Va., the men are still locked out at the plants of the Whittaker-Glessner Co., and it is now the intention of the company to operate the mills non-union.

The Chicago Metal Trades Association held its annual dinner Wednesday evening, March 16, at the Sherman House, Chicago. The following officers for the coming year were elected: President, H. H. Latham, Latham Mfg. Co.; vice president, F. S. North, Union Special Machine Co.; treasurer, John W. O'Leary, A. J. O'Leary & Son Co.; secretary, Paul Blatchford. The new executive committee includes the officers and the following: John D. Hibbard, the retiring president, John Davis Co.; F. Copeland, Sullivan Machinery Co.; R. W. Young, Weir & Craig Mfg Co.; Tom A. Jones, W. A. Jones Foundry & Machine Co.

TO PURIFY PIT WATER AT COKE WORKS.

The water for quenching coke at the ovens must of necessity be free from contaminating elements. The average purchaser of coke is influenced by appearance as well as by the chemical analysis and the maker takes no chances with the water used to quench his coke. Pit water is not suitable for this purpose. It is generally highly acid, containing in solution sulphates of iron, alumina, magnesia and other elements, with frequently an amount of free sulphuric acid. Such water, for example, as is found in the pits of the Connellsville region is of a reddish-yellow color and leaves a rusty red deposit, chiefly composed of iron and aluminum hydrates. The reddish tinge is objectionable, since a silvery whiteness is desired for the coke. The pit water is also useless for other industrial purposes because it rapidly corrodes pumps, boilers, pipes, etc. If this water could be purified inexpensively it could be employed for quenching coke, which is usually manufactured in proximity to coal mines. At the present time the water so used must be drawn through long pipe lines, often from sources some distance from the mines, and the extent and expense of these hydraulic installations is no small factor in coke production.

Prof. John W. Langley, of the Case School of Applied Science, Cleveland, has made a study of the question for some time, and has devised a system of pit water purification. He proposes to neutralize the water, render it alkaline, precipitating the iron and other elements already mentioned, and eliminate the free acid. The water is first treated with carbide of calcium and then with lime. It will be evident that in the selection of the purifying agencies the choice must of necessity be limited to those which can be cheaply obtained. A recent pipe line installation in the Connellsville region is valued at $25,000, with a constant cost of 10 cents for every thousand gallons of water. The purifier, to replace anything of this kind, must not only be simply constructed, but the treatment in labor and chemicals should be within the water cost of the older method. The solution proposed by Prof. Langley is partly mechanical and in part a chemical operation.

Prof. Langley found a pit water from the Connellsville region to contain 38.08 lb. of sulphuric acid and 21.7 lb. of iron in each 1,000 gallons, in addition to alumina and magnesia in smaller amounts. This water is so corrosive that it rapidly rusts and even dissolves iron nails, attacks zinc and tin and even copper in the presence of air. It is entirely worthless for drinking or any manufacturing purpose. The process of treatment patented by Prof. Langley leaves the water clear, colorless and non-corrosive. It will not leave the slightest colored stain on objects wet with it and may be pumped and piped with no more injury to iron apparatus than any ordinary lake or river water.

The process of purification consists in causing the pit water to flow over coarsely crushed limestone contained in a rotating cylinder. This drum is horizontal and turns on two hollow axes through which the water passes in a continuous stream. At the outlet from the cylinder the water, which is now reddish and turbid from the partial precipitation of the iron, enters a rectangular tank provided at the bottom with coils of perforated pipe. A flow of air is forced through this piping and thoroughly aerates the water and expels the carbonic acid derived from the action of the sulphuric acid on the limestone, and which if retained would cause a great waste of lime in the subseqtient operation.

The water passes from the aerating tank to a mixing tank where it is treated with a small quantity of quicklime to complete the operation and to throw down the last portions of the dissolved iron. The effect of the quicklime is instantaneous and the turbid mass at once forms large clots which promptly subside, leaving a clear, colorless and neutral water. The water has lost a considerable percentage of sulphur and therefore brings an insignificant amount to the coke.

Of course the expense of neutralizing acid water lies chiefly in the alkali chosen and in this process the quicklime, if used alone, would be of prohibitive cost in practice. By the use of limestone a part of the duty of the lime is performed, but by limestone followed by aeration nearly all the function of the lime is accomplished, leaving but a small portion of the latter needed for finishing the neutralization and clotting the precipitate. To quote Prof. Langley in reference to the sample of Connellsville pit water already mentioned:

"One thousand gallons of this water would require 21.3 lb. of quicklime if used alone, but if limestone followed by aeration is first used then only 2.72 lb. of quicklime are needed. These figures are the results of actual tests. The cost of the process for a locality where reasonably cheap limestone and lime can be obtained will be under four cents per 1,000 gallons. The cost of a plant capable of treating 345,000 gallons per twenty-four hours, is estimated to be under $5.000."

The Royal Trust Co., of Chicago, has been appointed receiver of the assets of the Barton & Maas Foundry Co., Nineteenth and Rockwell streets, Chicago, on the petition of the C. A. Stevenson Pig Iron & Coke Co., St. Louis, Mo.

The name of the Chambers Machine Co., Cincinnati, has been changed to the Triumph Mfg. Co., Henry Chambers having sold his interest and retired. The capital stock will be increased from $10,000 to $25,000. A. H. Tuechter is president; S. P. Schauer, vice president, and Wm. Tuechter, secretary and treasurer. The company manufactures bakers' machinery.

At the meeting of the Council of the Iron and Steel Institute on Feb. 22, the Bessemer gold medal was awarded to Prof. J. O. Arnold of the metallurgical department of the University College at Sheffield, Eng.

Contracts have been awarded to the McClintic-Marshall Construction Co., of Pittsburg, by W. H. Brown, chief engineer of the Pennsylvania Railroad, for the steel work of the Duquesne elevated line. This will cost $500,000 and is to be completed early in the fall. The contract will comprise about 5,000 tons of steel which is now being fabricated at the Pottsville plant of the McClintic-Marshall Construction Co.

Arrangements have been completed between the Lazier Engine Co., of Buffalo, and the DuBois Iron Works, of DuBois, Pa., for the manufacture of the Lazier gas and gasoline engines. Arthur A. Lazier, formerly vice president of the Lazier Gas Engine Co. and patentee of the engine, is at the head of the Lazier Engine Co., which will have its chief offices in the Ellicott Square Bldg., Buffalo. The extensive DuBois Iron Works plant will be given over to the manufacture of the Lazier engines, which will be built in 18 sizes, from 2 to 100 h. p.

High water resulted in the shutting down of a large number of mills and blast furnaces along the Allegheny and Monongahela rivers in the Pittsburg district this week. High water was also experienced at Wheeling and it is probable that these plants will remain idle the remainder of the week for repairs of the damage done by the water and mud.

The Pennsylvania Engineering Works, New Castle, Pa., have abandoned the project of erecting a steel car plant in connection with the present works. The company required about two acres of land in addition to that which it now owns, but owing to the prohibitive prices asked by the owners of the adjoining property, it was decided not to proceed with the project.

J. A. Rogers, Neosho, Mo., has sold his foundry and machine work to Warren Heaton, and has removed to Joplin, Mo., where he will be manager of the Rogers-Conklin Mfg. Co., engineer, founder and machinist, of which he is president.

CAMBRIA STEEL CO. REPORT.

At the annual meeting of the Cambria Steel Co. held in Philadelphia March 21, directors and officers were re-elected. The officers at Philadelphia are: President, Powell Stackhouse; vice president, John W. Townsend; treasurer and assistant secretary, Alex. P. Robinson; assistant treasurer. Edward T. Stuart; secretary, D. B. Gehly. The officers at Johnstown are: General manager, Charles S. Price; solicitor and general agent, H. S. Endsley.

The annual report of President Stackhouse and the Cambria Steel board of directors states:

Mineral properties:—The coal, iron ore and limestone properties owned, produced satisfactory results. Their products are essential in the economical conduct of your manufacturing. Your company is fortunate in controlling so large a proportion of the raw materials consumed in your operations, but as favorable opportunities offer, the quantities of these base supplies should be further supplemented, thus recognizing your corporate obligations to the future. Explorations for ore are being conducted on a large body of land in Michigan held under option. Your Penn Iron Mining Co. shipped from its mines on the Menominee Range, Michigan, 140,527 tons of iron ore for use at your works. The Republic Iron Co., of Michigan, of which you own about 99½ percent of the capital stock, shipped from its mines in the Marquette district, Michigan, 123,120 tons of iron ore, about 110,000 tons of which you will use, the remainder having been sold. The Mahoning Ore & Steel Co., Mesabi district, Minnesota, of which you own 50 percent of the capital stock, produced, on account of your one-half interest, 350,000 tons iron ore in 1904; its annual output can be increased, when required, and its ore reserves are ample to supply you with this class of ores for a very long term of years.

Franklin Plant:—The work that has been carried on during the year has been in the direction of the completion of the plant in accordance with plans contemplated when originally designed.

Open Hearth:—In November, 1903, five 50-ton furnaces were under construction; the product not being then required, work was suspended. This was resumed during 1904, and at this date three of these are producing steel; the two remaining should be operative within ninety days, completing the fifteen 50-ton furnaces authorized, with an estimated capacity of 30,000 tons of steel ingots per month.

Plate mill:—The two additional plate slab heating furnaces under suspension per last annual report are now being completed.

Blast furnace.—No. 7 blast furnace construction, authorized in April, 1903, work was suspended in November, 1903, and resumed in latter part of 1904, and is now being pushed to completion.

Coke ovens:—The 100 Otto-Hoffman ovens, under construction at last report, were completed and put in operation in August and September, and are producing satisfactory results, making a total of 260 by-product ovens in use. To provide for your increasing output of metal, an additional 100 ovens should be authorized during 1905.

Car shops:—Owing to the suspension of car orders by railroad companies, this plant was operated during 1904 only for a short time. Orders now in hand promise full work for 1905.

Improvements:—The physical condition of your plant has been fully maintained by current repairs and additions. There was expended for improvements $730,033; of this amount $656,051 was charged to plant additions, and the remainder, $73,981, was repaid by amount realized from sales in 1904 of real estate and minerals, under terms of your lease from Cambria Iron Co. There was expended, in addition, $224,318 for replacements and alterations, and charged to operating accounts.

Manufacturers Water Co.:—This corporation, of which you control the entire capital stock, provides the water supply for your works; your use averages 53,000,000 gallons daily.

Hinckson's run reservoir:—Construction commenced in 1902, work was proceeded with during 1904, and $109,336 expended thereon. This is now in use, and is substantially completed. Conemaugh pipe line is completed and in use. The amount expended in 1904 was $43,611.

Quemahoning reservoir and pipe line:—Active work on this has been confined to engineering.

Production:—Shipments of steel show a decrease, compared with the preceding year, of 25 2-10 percent in quantity, and in the gross value of all products shipped of 36 7-10 percent The depression in the steel business that commenced in the summer of 1903, continued in a more severe form up to October, 1904; it was most pronounced in curtailments of orders on the part of railways and shipyards, little new building being done, and repairs either neglected or maintained at the minimum. Commencing with October, 1904, your business has been of satisfactory volume, excepting in plates and rails. Your plate mill has been turning out about half product and your heavy rail mill has been idle or running on a restricted tonnage and profit.

No appropriations out of income to the betterment fund were made in 1904, but the company spent over $700,000 for improvements which were charged to capital account. The betterment fund, created out of appropriations in the previous two years, it will be seen, stands at $2,000,000 and is sufficient to about cover the cost of the blast furnace now building. The accounts payable, exclusive of dividend No. 7, are only about $900,000, whereas the company has $3,815,168 accounts receivable, a large amount of cash and nearly $5,500,000 in materials and supplies.

The balance sheet as of Dec. 31, 1904, is as follows:

ASSETS.

Property, works, coal, ore lands, etc., subject to lease for 999 years at 4 percent on $8,468,000 Cambria Iron Co. stock	$33,090,301
Plant additions	5,166,642
Real estate, titles in Cambria Steel Co.	78,440
Sundry securities	1,160,282
Material, supplies and products	5,406,442
Equipment	549,260
Special deposit	2,500,000
Cash	1,084,078
Accounts receivable	3,815,168
Bills receivable	115,064
	$52,965,683

LIABILITIES.

Capital stock	$45,000,000
Gen. deprec. fund	1,550,000
Betterment and impt. fund	2,000,000
Accounts payable, including div. No. 7, $675,000	1,581,772
Bills payable (term notes)	610,000
Profit and loss acct.	2,223,911
	$52,965,683

The authorized capital stock named in charter is $50,000,000 of which $45,000,000 have been issued. The remaining $5,000,000 are unissued, and can only be issued hereafter for money or property. Of the $3,500,000 term notes issued December 15, 1900, $2,890,000 have been paid, including $665,000 in 1904, leaving $610,000 outstanding, $45,000 of which are due and payable in 1905 and $565,000 in 1906.

The Alabama Consolidated Coal & Iron Co. will build a new furnace at Gadsden, Ala. Engineers have been ordered to prepare the site for the new furnace and it is expected to be in operation within a year. The new furnace will be equipped with skip hoist and other late improvements in furnaces and will have a daily capacity of between 200 and 300 tons. The estimated cost is only $350,000, owing to the fact that when the last furnace was built, the company had in view the building of another stack, and some of the equipment is ample for two furnaces.

Annual Report of the United States Steel Corporation.

The third annual report of the United States Steel Corporation has been issued, covering operations for the year ending Dec. 31, 1904. The report is printed in an ample pamphlet of 45 pages 9¼ x 11½ in. in size and gives in full as heretofore the statistics of the year, financial and manufacturing, constituting far more detail than is published by any corporation concerning its operations. Extracts from the more important sections of the report are given below:

Income Account for the Year 1904.

The total net earnings of all properties after deducting expenditures for ordinary repairs and maintenance (approximately $18,000,000), also interest on bonds and fixed charges of the subsidiary companies, amounted to		$73,176,521.73
Less Appropriations for the following purposes, viz.:		
Sinking Funds on Bonds of Subsidiary Companies	$1,583,116.76	
Depreciation and Extinguishment Funds	3,907,166.55	
Extraordinary Replacement Funds	8,667,044.36	14,157,327.67
Balance of Net Earnings in the year 1904		$59,019,194.06
Deduct:		
Interest on U. S. Steel Corporation 50 Year 5 per cent. Gold Bonds	$15,197,850.00	
Interest on U. S. Steel Corporation 10-60 Year 5 per cent. Gold Bonds	8,320,442.75	
Sinking Fund on U. S. Steel Corporation 50 Year 5 per cent. Gold Bonds	3,040,000.00	
Sinking Fund on U. S. Steel Corporation 10-60 Year 5 per cent. Gold Bonds	1,010,000.00	27,568,292.75
Balance		$31,450,901.31
Less: Charged off for Employes' Bonus Funds, for adjustment in Inventory valuations and for sundry accounts		1,183,272.12
Balance		$30,267,629.19
Dividends for the year 1904 on Preferred Stock of U. S. Steel Corporation, 7 per cent		25,219,677.00
Undivided Profits for the year, carried to Surplus Account and appropriated for payment of construction and capital obligations		$5,047,852.19

Undivided Surplus of U. S. Steel Corporation and Subsidiary Companies.

(Since April 1, 1901.)

Surplus or Working Capital provided in organization		$25,000,000.00
Balance of Surplus accumulated by all companies from April 1, 1901, to December 31, 1903, per Annual Report for year 1903, exclusive of amount of $10,371,803.25, transferred January 1, 1904, in connection with inauguration of new accounting plan adopted as of that date, to separate surplus account as shown below	$30,724,879.11	
Less: Adjustments in sundry accounts in 1904	31,516.80	30,693,362.31
Undivided Profits of all companies for the year 1904		5,047,852.19
		$60,741,214.50
Less: Charged off on December 31, 1904, by authority of the Board of Directors, for expenditures made from Surplus for construction and payment of capital liabilities (see page 21), viz.:		
Expenditures made during year 1904	$5,563,985.61	
Expenditures made during previous years	2,929,249.97	8,493,235.58
Balance of Undivided Surplus, December 31, 1904, exclusive of subsidiary companies' Inter-Company profits in Inventories		$52,247,978.92
Undivided Surplus of subsidiary companies representing profits accrued on sales of materials to other subsidiary companies, and on hand in latter's inventories, viz.:		
Balance on December 31, 1903, transferred as above	$10,371,803.25	
Less: Decrease during the year 1904	1,254,336.48	
Balance, December 31, 1904		9,117,466.77
Total Undivided Surplus, December 31, 1904		$61,365,445.69

In the annual report for 1903 reference was made to the fact that it had been decided, commencing with January, 1904, to take over into the aggregate earnings reported currently for all companies the profits arising to one subsidiary company from sale of materials to another, only when such profits shall have been actually realized by the conversion of the materials involved into finished products, and the sale and delivery of the same to customers outside of the organization. Prior to January, 1904, the profits in question had been reported in the combined earnings of all companies concurrently with the delivery of the materials by one company to another, and without reference to whether the receiving company had at that time converted and shipped the material, or continued to carry it in its inventory. In order to inaugurate this new method of accounting it was necessary to segregate and carry in a separate surplus account the amount of such inter-company profit which was included in the undivided surplus reported on Dec. 31, 1903. Accordingly the amount of $10,371,803.25 was transferred as at Jan. 1, 1904, and, as shown in the preceding statement of undivided surplus, is separately reported. At the close of the year 1904 the amount of such inter-company profits had been reduced to $9,117,466.77, owing principally to the diminution of quantities of inter-company materials on had in inventories in comparison with Dec. 31, 1903.

Under the plan of accounting now in vogue these intermediate inter-company profits are, in effect, carried into the combined accounts for all companies, first, to the specific surplus account representing such profits, not being included or reported, however, in statements of net earnings of all properties as from time to time published, *except* when and as they are transferred from said specific surplus account as hereinafter stated. When materials carrying such inter-company profits are worked up into finished products and are shipped to customers outside of the organization, and thus converted from an inventory asset into cash or accounts receivable, the inter-company profits previously accrued on such materials and carried theretofore in the specific surplus account referred to, are transferred to and repoted in the current earnings statements. Therefore, the net earnings reported under this plan for all companies represent practically cash earnings to the organization. This method of accounting is conservative and assures greater uniformity from month to month with reference to the net earnings reported in comparison with the cash income of the organization as a whole, and any possible adjustment at close of year in the inventory valuation of inter-company materials on hand will be made without affecting in any way the current year's earnings and income as previously reported. Any such adjustments would be made against the specific or suspended surplus account. The plan also permits the ascertainment of operating and production expense statistics on a more uniform basis from month to month.

As in previous years' reports, the statements of accounts, statistics, etc., presented in the present report, comprehend the combined results for the United States Steel Corporation and all the subsidiary companies. The condensed balance sheet exhibits the combined assets and liabilities of the United States Steel Corporation and of the several subsidiary companies, based on the valuations at which the stocks of the subsidiary companies and the Carnegie Co. bonds were acquired by the Steel Corporation, but *liabilities from one company to another are omitted from both liabilities and assets.*

Maintenance, Renewals and Extraordinary Replacements.

The expenditures made by all companies during the year for maintenance, renewals and extraordinary replacements, the entire amount of which has been charged to current operating expenses or earnings, equaled the sum of $26,258,372.22, a decrease in comparison with the outlays during the preceding fiscal year of $8,526,818.99. Of this total decrease the sum of $3,689,914.95 was in the outlays for current and ordinary maintenance. Fewer repairs were necessary because the

plants and properties were not operated as continuously as in the previous year. The reduction in the expenditures for extraordinary replacements equaled $4,836,904.04. The expenditures of this class during the previous year were, however, unusually heavy. Notwithstanding the foregoing reduction, these outlays during the fiscal year of 1904 exceeded by $176,081.19 the similar class of expenditures made during the year 1902. It is always necessary to expend large sums for extraordinary replacements, particularly in connection with the manufacturing properties, owing to the constantly changing methods and processes of manufacture and the rapid deterioration of equipment and facilities required for the heavy class of work on which the mills are largely employed. It is essential that the latest and most approved methods of manufacture be adopted in order to insure the operation of the properties at the minimum cost. All requirements for these purposes it is the policy of the subsidiary companies to pay from and charge to funds established for that purpose by regular provisions from net earnings. The general physical condition of the plants and properties, collectively speaking, at the close of the year was better than ever before. A statement showing the principal items of improvements comprehended in the total outlays for extraordinary improvements is included in the statistical tables printed in this report.

The following table shows the apportionment between the several groups of operating properties of the year's expenditures for maintenance and replacements:

	EXPENDITURES DURING YEAR OF 1904				
	Ordinary Maintenance and Repairs	Extraordinary Replacements*	Total	Total Expenditure in Previous Year	Decrease
Manufacturing Properties	$12,857,738.82	$6,702,104.41	$19,559,843.23	$26,314,249.58	$6,754,406.35
Coal and Coke Properties	983,389.61	676,084.90	1,659,474.51	1,161,837.05	Inc. 497,637.46
Iron Ore Properties	209,475.11	152,828.44	362,303.55	511,224.32	148,920.77
Transportation Properties:					
Railroads	3,679,735.90	338,286.26	4,018,022.16	5,759,911.30	1,741,889.14
Steamships and Docks	291,103.24	197,982.12	489,085.36	871,040.14	381,954.78
Miscellaneous Properties	134,055.75	35,587.66	169,643.41	166,928.82	Inc. 2,714.59
Total expended in 1904	$18,155,498.43	$8,102,873.79	$26,258,372.22	.....	.....
Total Expended in 1903	21,845,413.38	12,939,777.83	34,785,191.21	34,785,191.21	.....
Decrease	$3,689,914.95	$4,836,904.04	$8,526,818.99	.....	$8,526,818.99

*These expenditures were paid from funds provided from earnings to cover requirements of the character included herein.

Sinking, Depreciation, Extraordinary Replacement and Improvement Funds.

As shown by the income account reservations are made from net earnings for Bond Sinking Funds and for various other funds. The amounts raised annually are based primarily on the estimated requirements for the purposes for which the funds are created. The provisional charges to operations for the establishment of these funds are made monthly, being distributed, however, to the several months with reference to the volume of business transacted by the respective subsidiary companies. Accordingly the monthly provisions from earnings may vary considerably. The purposes for which these funds are particularly reserved and applied are as follows:

Bond Sinking Funds.—These are funds required by the respective mortgages to be set aside annually for retirement of the bonds issued thereunder.

Depreciation and Extinguishment Funds.—The appropriations for these funds have been made with the idea that thus aided the Bond Sinking Funds will liquidate the capital investment in the properties at the expiration of their life. The moneys or proceeds representing these funds are specifically segregated, and, except as used for purposes hereinafter stated, are invested in interest bearing securities, the accretions thereto being added to the funds. These funds are used only for the purpose of retiring capital obligations and for acquiring new property, such as ore and coal, to offset the consumption and depreciation of properties of that character.

Extraordinary Replacement Funds.—These funds are used to improve, modernize and strengthen the properties. They are not used for ordinary maintenance, repairs and renewals (such expenses are included in current operating costs), but for the rehabilitation of departments and plants through entire rebuilding or rearrangement, the installation of labor saving devices, and the substitution of improved and modern machinery, equipment, facilities, etc., for obsolete types, etc. They are designed to provide for the current depreciation and obsolescence which is constantly taking place in the physical condition of a property, but cannot be definitely cared for by replacement or substitution from year to year. It is contemplated that a substantial balance shall always be maintained to the credit of these funds. During the three years ending Dec. 31, 1904, the provisions from earnings for these funds exceeded the expenditures made by $10,768,666.40, and at close of fiscal year the total balance to credit of the funds was $15,931,472.

The appropriations made to the funds for the year ended Dec. 31, 1904, together with the payments made therefrom, and the condition of the funds at the close of the year, are shown in the following table:

	CREDITS TO FUNDS					
	Balance Dec. 31, 1903	Set Aside from Earnings During 1904	Sundry Credits to Funds	Total	Payments and Charges	Balance to Credit of Funds Dec. 31, 1904
Sinking Funds on U. S. Steel Corporation Bonds	$2,530,833.33	$4,050,000.00	.....	$6,580,833.33	$4,050,000.00 (a)	$2,530,833.33
Sinking Funds on Bonds of Subsidiary Companies	485,225.60	1,583,116.76	$148,085.23	2,216,427.59	1,661,275.98 (a)	555,151.61
Depreciation and Extinguishment	2,298,609.70	3,907,166.55	262,460.30	6,468,236.55	3,022,529.23 (b)	3,445,707.32
Total Capital Depreciation Funds	$5,314,668.63	$9,540,283.31	$410,545.53	$15,265,497.47	$8,733,805.21	$6,531,692.26
Extraordinary Replacement and Improvement	15,269,612.69	8,667,044.36	271,932.99	24,208,590.04	8,277,118.04 (c)	15,931,472.00
Total	$20,584,281.32	$18,207,327.67	$682,478.52	$39,474,087.51	$17,010,923.25	$22,463,164.26

(a), (b), (c), see footnotes.

(a) Payments to trustees of sinking funds, $5,711,275.98; (b) amounts charged off for payments from these funds for additional property acquired, $1,040,835.69; bonds, mortgages, etc., retired, $1,981,693.54; (c) expenditures made for extraordinary replacements and renewals, and construction expenditures, $8,277,118.04.

The balances to the credit of the several funds on December 31, 1904, per the preceding table, are included in the current assets of the organization, making a total of $22,463,164.26. Of this amount, $3,090,937.49 is in depreciation and extinguishment fund assets; $3,447,866.25 in sundry marketable securities, $757,500 in cash (special deposit), and $15,166,860.52 in current assets, cash, inventories, etc.

Trustees of Bond Sinking Funds.

The transactions for account of the Bond Sinking Funds of the United States Steel Corporation and its subsidiary companies for the year, and the condition of the funds on December 31, 1904, are shown in the following table:

Funds	Cash Uninvested Dec. 31, 1903	Installment Received in 1904	Interest Accretions Received in 1904	BONDS REDEEMED Total	Par Value of Bonds	Discount Gained	Cash Uninvested Dec. 31, 1904
U. S. Steel Corporation Bonds	$6,955.05	$4,050,000.00	$376,472.71	$4,433,427.76	$4,561,000.00	$137,877.77	$10,305.53
Subsidiary Companies' Bonds	490,096.09	1,661,275.98	145,103.65	2,296,475.72	1,763,000.00	*1,747.65	531,728.07
Total	$497,051.14	$5,711,275.98	$521,576.36	$6,729,903.48	$6,324,000.00	$136,130.12	$542,033.60

*Premium paid.

Redeemed Bonds held by Trustees of Sinking Funds.

	U.S. Steel Corp'n Bonds	Subsidiary Cos. Bonds	Total
Total Redeemed Bonds, at par, held by the Trustees on December 31, 1903	$5,598,000	$2,583,000	$8,181,000
Redeemed in 1904, as above	4,561,000	1,763,000	6,324,000
Total	$10,159,000	$4,346,000	$14,505,000
Less, Cancelled by the Trustees and returned to the company	.....	426,000	† 426,000
Leaving Redeemed Bonds held by the Trustees December 31, 1904, interest on which is currently paid into the Sinking Funds	$10,159,000	$3,920,000	$14,079,000

† Includes $98,989.48 of Bonds account of minority interest in Pittsburg, Bessemer and Lake Erie Railroad Company not included in statement of Bonded Debt.

Capital Stock.

The amount of outstanding capital stock of the United States Steel Corporation on Dec. 31, 1904, was the same as at the close of the preceding fiscal year, as follows: Common stock, $508,302,500.00; preferred stock, $360,281,100.00.

Bonded Debenture and Mortgage Debt.

The total bonded and mortgage debt of the corporation and subsidiary companies held by the public on January 1, 1904, was $553,447,257.47; United States Steel Corporation 10-60 year five percent bonds issued and sold in 1903, but undelivered on December 31, 1903, $17,097,500. To this are to be added bonds and mortgages of the Clairton Steel Co. and its subsidiary interests, which were outstanding at the time the stock of that company was acquired by the corporation, amounting to $12,896,715.31; and there are also to be added issues made during the year of the Duluth, Missabe & Northern Railway Co. second mortgage bonds and American Steamship Co. first mortgage bonds, amounting to $103,000, making a total of $583,544,472.78. From this total are to be deducted bonds and mortgages retired or acquired during the year amounting to $2,173,314.99, and bonds purchased by trustees of sinking funds amounting to $6,225,010.52, making a total of $8,398,325.51, which being deducted from $583,544,472.78 leaves $575,146,147.27 as the bonded debenture and mortgage debt in the hands of the public December 31, 1904. The increase in bonded and mortgage debt during the year, due to the acquisition of Clairton steel properties, was $12,896,715.31, and the net decrease during the year, due to retirements and purchases for sinking funds, was $8,295,325.51. The net increase in bonded and mortgaged debt in the hands of the public December 31, 1904, in comparison with December 31, 1903, was $4,601,389.80.

Purchase Money Obligations, Bills Payable and Special Deposits.

A net reduction of $4,792,775.70 was made during the year in the unsecured liabilities of the subsidiary companies of the above character. The net reductions during the year, also during the period from April 1, 1901, to Dec. 31, 1904, in the respective classes of liabilities under the above heading were as follows: Paid off during fiscal year 1904, $4,792,775.70; paid off between April 1, 1901, and Dec. 31, 1903, $31,329,885.09; total reduction April 1, 1901, to Dec. 31, 1904, $36,122,660.79, of which amount the sum of $7,815,881.22 represents moneys originally borrowed or received and used as working capital, while the balance represents specific obligations originally incurred for the acquirement of property, or for moneys used for the purchase of property or the discharge of capital liabilities.

The outstanding liabilities of above character on Dec. 31, 1904, in comparison with the amount outstanding on Dec. 31, 1903, are as follows:

Purchase Money Obligations	$1,099,441.76	$3,476,641.92	$2,377,200.16
Bills payable	3,539,134.64	4,429,484.50	890,349.86
Special Deposits	2,416,568.87	3,941,794.55	1,525,225.68
Total	$7,055,145.27	$11,847,920.97	$4,792,775.70

Production.

The production of the several properties for the year, in comparison with the results for the fiscal year of 1903, was as follows:

	1904.	1903.	1902.
MINES.			
Iron ore mined	10,503,087	*15,363,355	16,063,179
Coke manufactured	8,652,293	8,658,391	9,521,567
Coal mined	1,998,000	1,120,733	709,367
Limestone quarried	1,393,149	1,268,930	1,313,120
Pig iron	7,210,248	7,123,053	7,802,812
Spiegel	100,025	121,779	128,265
Ferro-manganese and silicon	59,148	34,409	44,453
Total	7,369,421	7,279,241	7,975,530
STEEL INGOT PRODUCTION.			
Bessemer ingots	5,427,979	6,191,660	6,759,210
Open-hearth ingots	2,978,339	2,976,300	2,984,708
Total	8,406,378	9,167,960	9,743,918
FINISHED PRODUCTS.			
Steel rails	1,242,646	1,934,315	1,920,786
Blooms, billets, slabs, sheet and tin plate bars	932,020	493,292	782,637
Plates	404,422	519,713	649,541
Heavy structural shapes	313,779	362,765	.....
Merchant steel, skelp hoops, bands and cotton ties	577,384	634,830	1,254,560
Tubing and pipe	710,765	†710,555	†664,341
Rods	84,934	101,699	109,330
Wire & products of wire	1,226,610	1,126,605	1,122,809
Sheets, blk. galv and tin plate	735,482	†763,670	†699,621
Finished structural work	357,485	459,692	481,029
Angle and splice bars & joints	72,470	138,709	139,954
Spikes, bolts, nuts and rivets	46,003	53,259	42,984
Axles	62,981	119,716	136,787
Sundry iron and steel products	25,787	30,059	29,177
Total	6,792,780	7,458,879	8,033,556
Portland cement bbls	539,951	644,286	486,357

† Tonnages for these products as specified in reports for 1902 and 1903 have been changed from net to gross tons.
*Decreases in ore tonnage due principally to the large stocks on hand at furnaces and lower lake docks, carried over from 1903.

Inventories.

The aggregate inventories of all properties on Dec. 31, 1904, equaled $94,812,546, a decrease in comparison with Dec. 31, 1903, of $13,163,977. Nearly one-half of this decrease is in the item of ore, of which there was a considerable less tonnage on hand at mines, lake docks and furnaces than at the close of the preceding fiscal year. The inventories of the other commodities showed generally a decrease, owing to there being less quantities on hand, and to the fact that the prices at which they are inventoried are somewhat below those of Dec. 31, 1903. The smaller volume of business transacted during the fiscal year furnishes an explanation generally for the decrease in the working stocks of some of the raw and semi-finished materials on hand. The increased demand for products which developed in the late fall of 1904 has resulted in the necessity for carrying larger inventory stocks, and considerably more working capital will accordingly be required during 1905. Inventory valuations are considered to be conservative. The aggregate inventory valuation of all raw, partly finished and finished materials produced within the organization is very largely below the market prices on Dec. 31, 1904. No profit is taken up by any one subsidiary company on materials and products of its own production until the same have been shipped to its customers. Among the important items of the inventories are the following: Ores, $36,205,977 on Dec. 31, 1904, against $42,018,988 on Dec. 31, 1903; pig iron and scrap, $4,947,716, against $5,885,039; manufacturing supplies, stores and miscellaneous items, $6,411,222, against $7,837,113; blooms, billets, slabs, sheet and tin bars, etc., $4,844,661, against $5,321,339; finished products, $21,016,539, against $21,564,586; material, labor and expenses locked up in bridge and structural contracts, $15,239,378, less bills rendered on account, $11,892,455, against $23,468,732, less bills rendered on account, $16,028,984.

Capital Expenditures.

The expenditures made by all companies during the year and chargeable to capital account for construction and the acquisition of additional property, less credits for property sold, equaled the sum of $17,957,946.17. These expenditures comprehend only actual additions and extensions to the

plants and properties. These expenditures should not be confused with those made for extraordinary replacements and improvements, which are paid from and charged direct to funds currently provided from earnings, although in practically every instance such replacements more than replace and actually increase the production or operating capacity and reduce costs. As the element of substitution is involved, they are currently charged off as indicated. The capital expenditures as below represent wholly new and additional property. The capital expenditures for the year are classified by property groups, as follows:

Manufacturing Properties	$12,191,595.88
Coal and Coke Properties	1,490,502.18
Ore Properties	1,580,655.60
Transportation Properties	2,430,158.09
Miscellaneous Properties	265,034.42
Total for the year 1904	$17,957,946.17
Amount expended for Construction and Additional Property from April 1, 1901, to January 1, 1904	64,585,536.37
Making a grand total expended to January 1, 1905, of	$82,543,482.54

Included in the foregoing grand total is the sum of $10,004,238.03, expended since Dec. 1, 1902, for completion of the furnaces, steel works and mills of the Union Steel Co., and the development of its coal, coke and transportation properties, practically all of which work was under way when the stock of that company was acquired by the Steel Corporation.

Some of the principal additions to the properties of the subsidiary companies on account of which the above expenditures were made during the year are as follows:

Manufacturing Properties.

Total expended during the year by all manufacturing companies $12,191,595.88

Carnegie Steel Co.—Additions completed during year: 140 inch sheared plate mill, Homestead plant; new hot metal mixer, Bellaire plant; two new blast furnaces, Ohio Works, Youngstown; new office building at Duquesne plant.

Illinois Steel Co.—Additions completed during year: addition to foundry; additional heating capacity at rail mill, and additional casting machine at South Works. Work in progress: Five additional blowing engines; new 48-inch universal plate mill; new O. H. furnace plant (seven 50-ton furnaces); additional blooming mill; and new 28-inch structural mill at South Works. New cement plant at Buffington, Ind., for manufacture of Portland cement, having an annual capacity of 1,300,000 barrels.

National Tube Co.—Work in progress at Lorain, Ohio plant: Two new blast furnaces; new skelp mill, comprising one 90-inch plate mill, one 48-inch universal mill, one 28-inch reversing mill, and one 14-inch continuous mill for making pipe skelp; new pipe mills for manufacturing tubes and pipe from one-eighth inch to 18 inches.

National Tube Co.—Work in progress at McKeesport, Pa., plant: Enlarging and rebuilding the National Works. Improvements consist of one additional blast furnace, new hot metal mixer, increasing capacity of converting works, rebuilding and increasing capacity of rolling mills, tube and pipe mills, and installing improved and additional power and water supply plant. Notwithstanding the total capacity, the new plant will be increased over the old to the extent of 55 per cent. in the production of pig iron, 66 per cent. in the production of steel, and 35 per cent. in the production of finisheds tubular product, only one-third of the entire cost of foregoing work is charged to capital account; the balance is charged direct to funds provided from earnings, as explained on page 10.

American Steel and Wire Co.—Work completed during the year: Additional power equipment at Anderson, Ind., and Scott Street Works. Additional wire equipment at Scott Street, Waukegan, Rockdale, Newburg, Salem and Worcester Works. Additional barb wire and field fence equipment at DeKalb, Scott Street, Waukegan, Rockdale and Pacific Works. Additional nail machines at H. P. Works, Braddock and Rankin Works. Enlarging facilities of Electrical Works, Worcester. Additional rope machinery at Worcester and Pacific Works. Additional rod mill equipment, Braddock Works, electric power plant and pig casting machinery at Allegheny Works. Additional blast furnace blowing engine at central furnaces. New ore rigs at central furnace docks. Additional real estate at Newburg and Scott Street Works. Work in progress: Additional wire drawing equipment at Scott Street Works, Consolidated, Allentown and Worcester Works. Additional nail machines at Braddock. Additional field fence machines at Waukegan and Consolidated Works. Additional hoop machines at Scott Street Works. New galvanizing furnace, Consolidated Works. New storage warehouses at Waukegan, DeKalb, Consolidated Works and Louisville, Ky.

American Sheet and Tin Plate Co.—Work completed during the year: New storage building and installation of additional hot mill at Monessen Works. Work in progress: Installing new O. H. acid furnace and additional galvanizing capacity at Vandergrift Works.

American Bridge Co.—Work completed during the year: The construction at Ambridge, Pa., of a new bridge plant for the fabrication of bridge and structural material of all kinds. The plant is particularly adapted for fabricating work of the heaviest type, and is fully equipped with auxiliary departments, such as foundries, eye-bar shops, bolt and rivet factories, machine shops, power, light and water supply plants, etc. The plant has an annual capacity of 240,000 net tons of finished structural work.

Union Steel Co.—Work completed during the year: Two blast furnaces, O. H. plant (twelve 50-ton furnaces), blooming mill and accessory works; also additional nail machines, barb wire and field fence machinery and galvanizing equipment at the Donora Works. Two blast furnaces and additional nail machines at South Sharon Works.

Coal and Coke Properties.

Total expended during the year by all coal and coke companies, $1,490,502.18. Work completed during the year: opening, developing and equipping No. 2 mine, Sygan, Pa.; also the mines of the River Coal Co., in Fayette county, Pa., including installation of plant for river shipments. Construction of by-product coke plant at Sharon, Pa. A considerable acreage of additional coal lands was also acquired during the year. A large amount of work, involving an expenditure of $773,517.95, was done during the year in the opening and development and the construction of coke ovens in the Pocahontas field in West Virginia, reference to which property has been made in previous annual reports. A considerable outlay will have to be made in 1905 and 1906 to bring this property up to its maximum producing capacity.

Ore Properties.

Total expended during the year by all ore companies, $1,580,655.60. Work completed during the year: Steel shaft, pump house, new dam and flume at Chapin mine. Opening, developing and equipping the Monroe-Tener and the Myers mines. These are new mines on the Mesaba Range. A large amount of additional machinery and equipment was installed at various mines, affording facilities for mining a greatly increased tonnage of ore. In addition to the capital outlays required for the foregoing, the above total expenditures include payments made during the year for acquirement in fee, or by leases on a royalty basis, of additional property containing large tonnages of iron ore. As much of the ore acquired has been obtained on a royalty basis, which does not represent a large initial cash outlay, the capital account increase is small in comparison with the amount of ore secured. A considerable amount was also expended for the acquisition of timber lands to provide timber for mining operations.

Transportation Properties.

Total expended during the year by all transportation companies, $2,430,158.09. The expenditures as above cover the cost of acquirement by the several transportation companies of the following additional equipment: Eight switching and four road locomotives, two passenger and one chair car, and 250 steel gondola cars. Also expenditures on account of the following construction work: By Connellsville Central R. R., construction of new line of railroad from Buffington, Pa., to Brownsville, Pa. By the Newburg & South Shore R. R., construction of new line of railroad from Central furnaces, Cleveland, Ohio, to the Newburg Steel Works, Newburg, Ohio. By the Elgin, Joliet & Eastern Ry., construction of new line of railroad from a junction on its main line near Joliet to the Rockdale plant of American Steel and Wire Company in Joliet, Ill.; also construction of new slip and dock at Waukegan, Ill. In addition to the foregoing a considerable amount was expended by the several railway companies for additional sidings, yard tracks, logging and mining spurs, buildings, etc. At Conneaut, Ohio, the Pittsburg and Conneaut Dock Co. expended for installation of additional ore handling machinery the sum of $157,851.92.

Miscellaneous Properties.

Total expended during the year by all companies, $265,034.42. The principal items of expenditure included in the above are for completion by Carnegie Natural Gas Co. of new pumping station in Wetzel county, W. Va.; the acquisition by Edgar Zinc Co. of gas territory and wells, and

the construction at Ambridge, Pa., by the American Improvement Co. of dwellings, which are rented or sold to employes.

Summary of Expenditures for Construction and Additional Property and for Payment of Capital Liabilities.

The following is a summary of the payments which have been made by all companies from April 1, 1901, to Dec. 31, 1904, for construction and additional property, and for payment of capital liabilities: Construction and additional property, $82,543,482.54; bonds and mortgages discharged, exclusive of bonds redeemed with sinking fund moneys, $6,772,970.48; bonds redeemed with bond sinking fund, $13,864,010.52; purchase money obligations paid off, originally issued for acquirement of property, $28,306,779.57; total, $131,487,243.11. Of the foregoing there have been financed by the issue and sale of securities, including $20,000,000 U. S. Steel Corporation 10-60 year five per cent bonds, $31,362,787.92, leaving a balance of expenditures of $100,124,455.19. The balance of expenditures has been paid with funds derived from the following sources: Bonds paid from bond sinking funds set aside from net earnings, and the interest accretions thereon, $13,864,010.52; expenditures paid from bond sinking, depreciation and improvement funds and formally charged off thereto, the property account being correspondingly reduced, $21,362,695.21; expenditures paid from surplus income and formally written off thereto, $25,727,364.16, making the total of payments from funds of income surplus and charged off thereto, $60,954,069.89. The balance of outlays made since April 1, 1901, for construction and new property, and for discharge of capital obligations, has been paid from the capital surplus provided at date of organization, and the balance of accumulated income surplus of the corporation and subsidiary companies as shown Dec. 31, 1904, and amounts to $39,170,385.30.

The capital expenditures of $39,170,385.30 paid from the surplus is represented in part by capital expenditures of $33,874,000 carried in property investment account, against which there may be issued $30,000,000 of United States Steel Corporation 10-60 year five percent bonds, which have been executed and certified, and are now held in the treasury of the corporation; and $3,874,000 of Union Steel Co.'s mortgage and collateral trust bonds, which may be issued at the option of that company to reimburse it for outlays for new property and construction. The remainder of the capital expenditures are $5,296,385.30 (being the balance of the outlay of $39,170,385.30 over and above the $33,874,000 of bonds which may be issued as stated), is carried in property investment account and covers investment in additional mineral lands amounting to $3,144,737.54, which will be repaid from future depreciation funds.

Employes and Pay Rolls.

The average number of employes in the service of all companies during the fiscal year of 1904, in comparison with the fiscal year of 1903, was as follows:

Employes of	1904. Number.	1903. Number.
Manufacturing properties	110,864	123,397
Coal and coke properties	15,654	17,873
Iron ore mining properties	8,477	13,768
Transportation properties	10,595	11,033
Miscellaneous properties	1,753	1,638
Total	147,343	167,709
Total annual salaries and wages	$99,778,276	$120,763,896

Number of Stockholders.

The number of stockholders of the United States Steel Corporation at the close of the fiscal years 1904 and 1903, respectively, was as follows:

	1904.	1903.	Decrease.
Preferred	39,654	42,720	3,066
Common	27,868	37,237	9,369
Totals	67,522	79,957	12,435

Employes' Subscriptions to Preferred Stock.

At the end of 1904 there was again offered to the employes of this corporation and of the subsidiary companies the privilege of subscribing for preferred stock of this corporation, under substantially the same conditions as offered in previous years, except the price fixed was $87.50 per share. Under this offer subscriptions were received from 8,429 employes, for a total of 17,973 shares. For the three years during which the stock subscription plan has been in force there have been received 44,740 subscriptions, for an aggregate of 97,168 shares.

General.

The depression in the iron and steel trade which, in common with all other lines of business, took place during the summer of 1903, continued until the late fall of 1904. The severity of the changed trade conditions is indicated by the lesser volume of business done for the year, as represented by gross sales and earnings, which show a decrease of 17 per cent. in comparison with 1903, and by a falling off of 33 per cent. in net earnings. While the total output of manufacturing properties shows a decrease in tonnage of finished products for sale of only about 9 per cent., it will be noted by table on page 16 that, except for the increase in blooms, billets, etc., on which the margin of profit is lowest, the percentage of decrease in the aggregate tonnage would have been nearly 15 per cent. In the latter part of the year 1904 there was a marked increase in the volume of business received, and this revival has continued. The tonnage of unfilled orders on the books on Dec. 31, 1904, was 4,696,203 tons of all kinds of manufactured products, in comparison with 3,215,123 tons at the close of 1903.

As shown by the several statements in this report, liberal expenditures have been made by the subsidiary companies during the year for maintenance, improvements and construction, it being the policy to maintain the various plants, mills and properties at the highest state of efficiency. The fact that the properties are in this condition, together with the efficient organization which exists, permits economical operating results and influences largely the net earnings, particularly in periods of depression in business. Notwithstanding the liberal outlay made for improvements, construction and new property during the last and preceding years, large expenditures must be made from time to time in order to keep pace with the growing demands of the country.

The unexpended appropriations which have been authorized for work to be done during the year 1905 equal approximately $31,000,000.

Reference was made in the last annual report to the fact that arrangements had been made with the United States Steel Products Export Co., whose capital stock is held by the Federal Steel Co., to act as export selling agent for the several subsidiary companies. Most satisfactory results have been obtained in respect to the export trade. A total of 1,021,672 tons of various products was shipped during the year 1904 for export. One of the essential features in this business is that the average production cost of similar commodities for domestic sale is thereby reduced.

Condensed General Balance Sheet, December 31, 1904.

ASSETS.

Property account:		
Properties owned and operated by the several companies:		
Balance of this account as of December 31, 1903		$1,357,394,468.88
Adjustments during 1904 in foregoing balance	Cr. 28,920.73	
Clairton Steel Co. properties—cost as acquired May 1, 1904	10,759,560.42	
Expended for construction and additional property in 1904	17,957,946.17	
	$1,386,083,054.74	
Less: Charged off to the following accounts, viz:		
To bond sinking funds	$ 426,000.00	
To depreciation and extinguishment and replacement funds	3,196,773.48	
To undivided surplus	8,493,235.58	
	12,116,009.06	
		$1,373,967,045.68
Deferred charges to operations:		
Expenditures for stripping and development at mines, for advanced mining royalties, and miscellaneous charges, chargeable to future operations of the properties		5,559,656.93

Investments:		
Outside real estate and other property		1,920,175.75
Sinking and reserve fund assets:		
Cash held by trustees account of bond sinking funds	$ 542,033.60	
($14,079,000 par value of redeemed bonds held by trustees, not treated as an asset.)		
Insurance fund assets (at cost)	2,708,138.88	
Depreciation and extinguishment fund assets (at cost)	3,090,937.49	
Contingent fund and miscellaneous assets	617,338.67	
		6,958,448.64
Current assets:		
Inventories*	$94,812,546.27	
Accounts receivable	36,150,516.59	
Bills receivable	3,124,242.95	
Agents' balances	733,270.97	
Sundry marketable stocks and bonds	7,141,736.94	
Cash (in hand and on deposit with banks, bankers and trust companies subject to check)	60,646,426.94	
		202,608,740.66
		$1,591,014,067.66

*Inventory valuations include profits accrued to subsidiary companies on materials and products sold to other subsidiary companies and undisposed of by the latter—see contra specific surplus account for these profits. The total of all inventories is, however, below the actual current market prices.

LIABILITIES.

Capital stock of U. S. Steel Corporation:		
Common	$508,302,500.00	
Preferred	360,281,100.00	
		$ 868,583,600.00
Capital stocks of subsidiary companies not held by U. S. Steel Corporation (par value)		96,614.38
Bonded and debenture debt:		
United States Steel Corporation 50-year 5% bonds	$303,957,000.00	
United States Steel Corporation 10-60 year 5% bonds	170,000,000.00	
	$473,957,000.00	
Less: Redeemed and held by trustees of sinking funds	3,920,000.00	
Balance held by the public	$463,798,000.00	
Union Steel Co. Mtge. & Coll. trust bonds (guaranteed by U. S. Steel Corp.)	$ 37,626,000.00	
Clairton Steel Co. bonds (guaranteed by U. S. Steel Corp.)	9,480,000.00	
Subsidiary companies' bonds	64,768,666.48	
	$111,874,666.48	
Less: Redeemed and held by trustees of sinking funds	3,930,000.00	
Balance held by the public	107,954,666.48	
Debenture scrip, Illinois Steel Co.	38,674.41	
		571,791,340.89
Mortgages and purchase money obligations of subsidiary companies:		
Mortgages	$ 3,354,806.38	
Purchase money obligations	1,099,441.76	
		4,454,248.14
Current liabilities:		
Current accounts payable and pay rolls	$18,830,453.80	
Bills and loans payable (subsidiary companies)	3,539,134.64	
Special deposits due employes and others	2,416,568.87	
Accrued taxes not yet due	1,647,696.80	
Accrued interest and unpresented coupons	7,099,480.99	
Preferred stock dividend No. 15, payable Feb. 28, 1905	6,304,919.25	
		39,838,254.35
Total capital and current liabilities		$1,484,764,057.76
Sinking and reserve funds:		
Sinking, depreciation, replacement and improvement funds	$ 22,463,164.26	
Contingent and miscellaneous operating funds	4,576,142.09	
Insurance funds	3,224,224.26	
		30,263,530.61
Bond sinking funds with accretions		14,621,033.60
Represented by cash (and by redeemed bonds not treated as assets. See Contra.)		
Undivided surplus of U. S. Steel Corporation and subsidiary companies:		
Capital surplus provided in organization	$ 25,000,000.00	
Balance of surplus accumulated by all companies from April 1, 1901, to Dec. 31, 1903	30,693,362.31	
Net surplus for the year per income account	5,047,852.19	
	$ 60,741,214.50	
Less: Charged off for expenditures made from surplus for construction and for payment of capital liabilities	8,493,235.58	
Balance of surplus exclusive of subsidiary companies' inter-company profits in inventories	$ 52,247,978.92	
Undivided surplus of subsidiary companies, representing profits accrued on sale of materials and products to other subsidiary companies, on hand in latters' inventories	9,117,466.77	
		61,365,445.69
		$1,591,014,067.66

We have audited the above balance sheet, and certify that in our opinion it is properly drawn up so as to show the true financial position of the United States Steel Corporation and subsidiary companies on December 31, 1904.

PRICE, WATERHOUSE & CO., Auditors.

New York, February 28, 1905.

Expenditures for Improvements and Extraordinary Replacements.

During the Fiscal Year ending December 31, 1904.

These expenditures were paid from funds provided currently from earnings to cover requirements of the character included herein. The expenditures for the year are classified by property groups as follows:

Manufacturing properties	$6,702,104.41
Coal and coke properties	676,084.90
Iron ore properties	152,828.44
Transportation properties	536,268.38
Miscellaneous properties	35,587.66
Total	$8,102,873.79

The principal improvement and replacement work covered by the foregoing expenditures is shown below.

Manufacturing Properties.

Carnegie Steel Co.—Work completed during the year: Edgar Thomson Works—New engine for rail mill; new boilers; extension to engine house and new blowing engines, furnaces F, G, H, I; additional blowing engines, furnaces A, B and C; new stoves, furnaces B and F; twelve additional ladle and cinder cars. Duquesne Works—New pressume pump; drilling well and steam pump. Homestead Works—Addition to Armour plate plant; new boilers; electric power transmission plant; remodeling four O. H. furnaces. Lucy furnaces—New supply pump. Isabella furnaces—Dry and blast plant. Bellaire Works—Hydraulic pumping plant. New Castle Works—Reconstruction of furnaces Nos. 2 and 3; new engine and generator, electric power plant; installation of two new scales; new oil house. Ohio Works—New car dumper; changing height of furnace. Upper Union Mills, Youngstown—Extension to electric power plant and new track scales. Painter mills—Installation of electric light plant. McCutcheon mills—Equipment for rolling light rails. Sharon Works—Remodeling bar mill to roll angles; two new heating furnaces; new water supply system. Work in progress: Edgar Thomson Works—New wharf and remodeling sewerage system. Duquesne Works—Four compound duplex pumps. Carrie furnaces—Rebuilding stoves, No. 2 furnace. Lucy furnaces—Rebuilding stoves. Ohio Works—New hot metal and cinder cars. Upper Union mills, Youngstown—Remodeling 7 and 8-inch combination mills. Clark mills—Installation of 8-inch guide mill. In addition a large amount of work was done in improving, remodeling and relining blast furnaces at the various furnace plants.

Illinois Steel Co.—Works completed during the year: South Works—Improvements at Bessemer department; ten new cinder ladles; enlarging granulating cinder plant; new cast house at blast furnaces; strengthening ore bridges; new automatic shovel for handling ore. North Works—Additional machinery in fitting shops. Joliet Works—Remodeling blast furnaces Nos. 1, 2 and 3; improvements at Bessemer department; installation of additional electric equipment; new locomotive crane in yard; new spike machine; four new cinder cars; extension of steam lines; additional tie plate shears, mechant mill. Work in progress: South Works—Improvement of plate mill; remodeling stoves at furnaces 1 to 4; addition to pumping station; fire protection system; enlarging laboratory building. Milwaukee Works—New boilers and engine. In addition a large amount of work was done in improving, remodeling and relining blast furnaces at the various furnace plants.

Lorain Steel Co.—Work in progress: Additional machinery and shop improvements, Johnstown Works.

National Tube Co.—Work completed during the year: New welding machine, American department; new boilers, Chester department. Work in progress: Two-thirds cost of

expenditures made during year in remodeling, rebuilding and enlarging McKeesport plant—(remaining one-third is charged construction); continuous heating furnace and locomotive traveling crane, McKeesport Works. Riverside department—New stock house and remodeling steel works, including installation of automatic machinery. Pennsylvania department—Improvement of tube plant and installation of water tube boilers. In addition a large amount of work was done in improving, remodeling and relining blast furnaces at the various furnace plants.

American Steel & Wire Co.—Work completed during the year: Anderson Works—Power improvement in rod and wire mills; new gas producer plant; new rod conveyor. DeKalb Works—Addition to cooper shop. Scott Street Works, Joliet—New main engine and electric unit; installation of new wire drawing blocks; new equipment for painting wire; electric welding apparatus. Rockdale Works, Joliet—Additional field fence equipment; additional poultry netting equipment; fire protection system; new hot balling furnace; additional equipment in machine shop. Waukegan Works—Four double and one single billet heating furnaces; additional tempering furnace; extension to warehouse; brick stack for boiler house. Consolidated Works—New engine for wire nail mill; cleaning house improvements. American Works—Compounding rod mill engine; cleaning house improvements. H. P. Works—Electric generator and engine; cleaning house improvements; new automatic stokers. Newburgh Steel Works—New boilers at blast furnace; improvements to ladle house; automatic stokers and coal handling equipment at Bessemer department boiler house; twelve soaking pits and one charging crane, blooming mill; extension to machine shop; stock bins and raising stock house; new blowing engine and remodeling and rebuilding stoves at Emma furnace. Newburg Wire Works—New electric generator and engine; new 60-in. lathe; additional equipment tinning building. Central Furnaces—New dynamos and engine; new water purifying plant; new office and storeroom building; new switching locomotive; compounding and condensing blowing engines; new boilers. Salem Works—New cooper shop and keg conveyor. Braddock Works—condensers for three engines; automatic billet conveyor; fire protection system. Rankin Works—New nail department building, including machinery and power equipment. Shoenberger Works—Blowing engine, Bessemer department; one narrow gauge locomotive; ore bins at blast furnace; installing slag crane, Bessemer department; new horseshoe calking and bending machine. South Works, Worcester—New machine shop and central warehouse; new electric unit; new Dolomite crusher; copper refining equipment. Electrical Works, Worcester—New high voltage testing plant; increasing paper cable saturating facilities. Rope Works, Worcester—New storehouse; additional rope machinery. Allentown Works—Compounding and condensing nail and wire mill engines. Work in progress: DeKalb Works—New generator and switchboard for light and power plant; addition to keg shop. Scott Street Works, Joliet—18-inch slotting machine; improving water supply system. Rockdale Works—New main engine; three motors for galvanizing frame; two duplex pumps. Waukegan Works—New annealing furnace; new planer. Newburgh Steel Works—Thirty ingot mold cars; feed water pump and heaters, blooming mill; improvements at Bessemer department. Central Furnaces—Remodeling, enlarging and improving blast furnaces and stoves; new pig casting machine and building. Central docks—Additional ore tracks. Braddock Works—New hoop machinery. Rankin Works—Installation of conveyor for finished goods; new electric equipment. Allegheny Works—New blowing engine. Shoenberger Works—New pumps at blast furnaces; two new boilers. North Works, Worcester—Additional electric power plant; new oil storage house; two new motors at thread mill. South Works, Worcester—Improvement of engine, boiler and power equipment. In addition a large amount of work was done in improving, remodeling and relining blast furnaces at the various furnace plants.

American Sheet and Tin Plate Co.—Work completed during the year: Monessen Works—Fire protection system; foot bridge over P. & L. E. tracks; additional tinning machinery. Shenango Works—Three duplex tinning machines and improving boxing house. Wellsville Works—Twenty-five sheet trucks; one straightening machine. Vandergrift Works—One straightening machine; sundry machinery. United States Works—New boilers. American Works—New traveling crane in bar building. Cambridge Works—Improvements to plant. Chester Works—Improving water supply system; improving annealing facilities; improvements to tinning house stacks; piling and filling, river front. La Belle Works—Improving water supply system. Monongahela Works—New office and store room building; installing heating furnaces; additional tinning equipment and machinery. New Castle Works—New boilers and connections; one new tinning machine. Scottdale Works—New steel storage building and crane. Wood's Works—Water purifying system; rebuilding roughing and finishing mill; centralizing steam plant; reconstruction of engine; new coal hoist. Anderson Works—Four stands cold rolls, conveyors and automatic packers. Work in progress: Guernsey Works—New traveling crane and runway. Wood's Works—New 21-inch sheet mill. In addition a considerable amount of expenditures was made for installation of sundry machinery and equipment.

Shelby Steel Tube Co.—Work completed during the year: Shelby Works—New regenerative billet heating furnace and rotary straightening machine; also sundry improvements to plant.

Union Steel Co.—Work completed during the year: Donora Works—Additional electric power equipment; new nail machine shop; equipment for electric welding; remodeling galvanizing department; fire protection system; additional machinery, etc. Sharon Works—Remodeling galvanizing furnace; installation of oil tanks; new crane magnet; sundry additional machinery and equipment in wire and nail department. Work in progress: Remodeling sheet mill, including installation of bray mills.

Coal and Coke Properties.

H. C. Frick Coke Co.—Work completed during the year: Redstone Works—New shaft, new steel trestle and bins. Baggaley Works—New steel tipple, pit mouth and larry tracks. Lambert Works—New fan, arching shaft bottom and new tracks. Leisenring No. 3 Works—New air compressor, boiler house, additional boilers, etc. Gates Works—New ice breaker. Lemont Nos. 1 and 2 Works—New compressor and pumping plant, also new draining line. Standard Works—Additional pump, including steam line and auxiliary works. Trotter Works—Steel head frame, shaft bottom, rearranging yard tracks, etc. Edenborn Works—Arching shaft bottom. Work in progress: The sum of $302,136.81 was expended during the year on account of the construction of 1,000 new coke ovens at Yorkrun, Shoaf and Bitner Works in the Connellsville region. These new plants are to replace ovens that will be abandoned, by reason of exhaustion of coal contiguous thereto, by the time the former are completed.

Ore Properties.

Work completed during the year: Chapin mine—Renewing hydraulic plant, new electric system and new electric locomotive. Mountain iron mine—Fifty-five stripping cars. Pioneer mine—New air line. Section 16 mine—Installation of triple expansion pumps and seventeen tram cars. In addition to the foregoing a considerable outlay was made for sundry miscellaneous machinery, equipment, pumps, line tracks, etc.

Transportation Companies.

Bessemer and Lake Erie Railroad—Expenditures aggregating $92,780.23 were made for various improvements, the principal item being $58,955.12 for rebuilding Elk Creek viaduct; the balance covers sundry improvements at various places for station buildings, terminals, side tracks, etc.

Union Railroad—Expenditures aggregating $31,098.07 were made for sidings and yard extensions and for sundry road improvements.

Elgin, Joliet and Eastern Railway—Expenditures aggregating $18,298.17 were made for various road replacements and improvements of an unusual nature, the principal ones being for interlocking plant at Hobart, new iron pipe culverts at various points on the line, and new coal chutes at West Chicago.

Chicago, Lake Shore and Eastern Railway—Expenditures aggregating $120,393.01 were made for various improvements, of which $38,132.09 covered part cost of five locomotives, purchased for replacements, and $22,768.46 for converting old box cars into flat and pig iron cars; the balance of the expenditures covers generally the installation of additional sidings and yard tracks.

Duluth and Iron Range Railroad—Expenditures aggregating $39,440.11 were made for account of the following improvements: For rebuilding ore dock No. 3, Two Harbors, $14,568.22; for addition to car shops, Two Harbors, $14,804.38; for part cost of reconstructing Fayal yard system, $2,665, and for sundry improvements, $7,402.51.

Duluth, Missabe and Northern Railway—Expenditures aggregating $35,554.98 were made for account of extension of ore dock No. 3, Duluth, $15,629.29; one new chair car, $6,000, and for sundry road improvements, $13,925.69.

Pittsburg Steamship Co.—Expenditures aggregating $197,982.12 were made for account of the following: For first payment on account of purchase of two 10,500 ton modern steel steamers, to replace an equivalent tonnage of old boats to be retired from the service, $157,119; the balance of the expenditures was made principally for account of installation of tow-

ing machines and deck engines on boats and for rearrangement of hatches to permit the use of automatic ore unloading machinery.

Miscellaneous.

Carnegie Natural Gas Co.—For installation of new 8-inch pipe line.

Pittsburg Limestone Co.—For reconstruction of crusher (three-quarters cost).

An attempt is being made by persons thought to be New York capitalists to purchase control of several large corporations in New England engaged in making textile machinery. It was announced last week that a concern, supposed to be the Saco & Pettee Co., of Newton, Mass., and Biddeford, Me., was endeavoring to purchase the Lowell machine shops, valued at from $2,000,000 to $2,500,000. It is now understood that New York men, who are in control of the Saco & Pettee Co. are behind the plan. It is further said that the syndicates also desires to consolidate the Draper Co., of . Hopedale; the Whitin Co., of Whitinsville, and the Kitson machine shops, of Lowell. Charles L. Hildreth, agent of the Lowell machine shop, says he has heard that the sale of his plant would result from present negotiations. He added: "It seems that there is an effort to merge machinery interests and to this fact I ascribe the willingness of stockholders to sanction the deal. More definite information may be available within a short time."

C. J. H. Woodbury, of Boston, Mass., assistant engineer of the American Telephone & Telegraph Co., recently gave an address on telephone line engineering before the electrical section of the Franklin Institute. In speaking of underground work he said in part: "A fine wire is sometimes drawn through a duct by a conical piece of wood with a thin leather washer filling the duct and forced ahead by the air pressure at the rear, which is exerted through the application of an air pump at the front end of the duct at the next manhole. This piece of wood is termed the 'mouse,' and the name is probably responsible for the persistent story that lines are first drawn through the conduits by a fine string tied to the tail of a tame rat who has been taught to do this work." In reference to the telephone development in general, Mr. Woodbury said: "The number of telephones has actually increased over 3½ times during the last five years."

At a meeting of the board of directors of the Buckeye Steel Castings Co., Columbus, O., March 16, Frank Rockefeller of Cleveland was elected president of the company to succeed the late W. F. Goodspeed. The vacancy on the board left by the death of Major Goodspeed was not filled at the meeting. Mr. Rockefeller, who is a brother of John D. Rockefeller, has long been connected with the company and has been a member of its board of directors since its organization. Reports presented at the meeting showed the company to be doing a larger business than ever before with many orders booked. It was decided to build a new pattern vault. The new furnaces which will greatly increase the capacity of the plant, were reported to be well under way.

Captain John Mitchell has decided to change the name of the steamer H. C. Frick to E. A. S. Clark. One of the four big steamers building for the Pittsburg Steamship Co. will be named Henry C. Frick. Mr. Clark is president of the Lackawanna Steel Co.

The National-Acme Manufacturing Co., of Cleveland, announces the consolidation of its New York and Philadelphia offices, with location at 95 Liberty street, New York, under the management of L. M. Waite, formerly in charge of the Philadelphia office. S. G. Goodrich is assistant. The company manufactures Acme automatic multiple spindle screw machines, Acme screw slotters, cap screws, set screws, special screws and parts milled from the rod or bar.

INDUSTRIAL SUMMARY.

[If you are in need of machinery of any description, please notify *The Iron Trade Review*, and we will put you in communication with our advertisers at once.]

New Buyers in the Market and Some of Their Wants:—

The Tuscaloosa Foundry & Machine Co., of Tuscaloosa, Ala., has been formed to carry on a general machine shop and foundry business. The officers are Ed. W. McDonald, president and manager, F. L. McDonald, vice president, and J. S. Hanson, secretary and treasurer.

The Panama Railroad Co., in co-operation with the Isthmian Canal Commission, will shortly call for bids for equipment of the most improved type of railroad cars, locomotives, etc. This equipment will include 24 10-wheel locomotives, 500 box cars, with an option to increase this number to 1,000; 500 standard flat cars, six first class passenger coaches suitable for use in a warm climate, twelve standard caboose cars, two sixty-ton first class wrecking cranes.

Articles of agreement of the Pilling Air Engine Co., Detroit, Mich., have been signed, and J. L. Pilling, formerly of Bucyrus, O., stated last week that the company would be incorporated with a capital stock of $25,000, fully paid in. A plant will be opened at the corner of Riopelle street and the Boulevard for the manufacture of various devices and engines invented by Mr. Pilling, which have heretofore been turned out in a plant at Bucyrus. About sixty men will be employed. The officers of the company are: President, J. C. Fleming, Detroit; vice president and general manager, J. L. Pilling, Detroit; secretary and treasurer, F. L. Bromley, of the Detroit Foundry & Mfg. Co., Detroit.

The Stoddard Drill Dredger Co., Chicago, has been incorporated with a capital stock of $20,000. The incorporators are: Edward B. Stoddard, John M. McCabe, Noble T. Robins.

The Rochester Valve Co., Rochester, N. Y., has been incorporated. Capital, $250,000. Directors, J. N. Beckley, J. H. Stedman, R. A. Salmons, Rochester.

The Griswold Mfg Co., Rock Island, Ill., has been incorporated with a capital of $20,000. The object is to manufacture machinery and advertising specialties. The incorporators are: M. O. Griswold, James P. Dromgoole and Theodore Briegel.

Fires and Accidents:—

The plant of the Connellsville Machine & Car Co., Connellsville, Pa., was destroyed by fire a few days ago. The loss was $75,000.

The foundry plant of the Hardie-Tynes Foundry & Machine Co., of Birmingham, Ala., was damaged by fire on March 12th to the extent of $20,000, which is covered by insurance. The fire evidently originated in the core ovens.

The foundry plant of the Rogers Machine Foundry Co., of Riverside, Cal., was damaged by fire to the extent of $3,000 on March 6th, with $2,000 insurance.

The steel casting department of the Youngstown Foundry & Machine Co., Youngstown, O., was damaged by fire March 18. The fire started from an explosion in the soaking room and caused a loss of $10,000.

The entire stock and building of Brown Bros., manufacturers of roofing and cornices, Spokane, Wash., were destroyed by fire March 10. Loss, $20,000; insurance, $2,500.

The W. A. Rogers Iron Works on Vine street, Riverside, Cal., were damaged by fire March 5. Loss, $1,500. The foundry was insured for $2,000.

Machinery and stock in the threading department of Spang, Chalfant & Co.'s plant, Pittsburg, were destroyed by fire March 16. Loss, $75,000 fully covered by insurance.

New Construction:—

A. L. Schultz of Pittsburg, formerly connected with the American Bridge Co., has plans under way for the erection of

a bridge plant at Buffalo, N. Y. It is probable that the plant will be built near the steel works of the Lackawanna Steel Co.

The American Car & Foundry Co. will build an addition to its plant at Madison, Ill., so that it can build steel underframe cars at that point.

The Maryland Rail Co., Cumberland, Md., whose machine shop and boiler house were destroyed by fire March 1, has repaired the damage to its plant and the mill was started March 13.

J. W. Johnson, manufacturer of laundry machines and supplies, whose plant was recently destroyed by fire, expects to rebuild on a larger scale than before.

The Hennepin Bridge Co., Minneapolis, Minn., expects to build a small structural shop in the near future, with a view to doing the larger part of its own work.

The Richard French Iron Works, Worcester, Mass., has been incorporated with a capital stock of $3,000, par value $100. The incorporators are: President, Sara A. French; treasurer, Harry B. French; clerk, William H. French; all of Worcester. The company will manufacture builders' iron work of all kinds, particularly fire escapes. It is not the intention to build at present, but a plant will probably be erected at some future time.

The Eagle Lock Co., Terryville, Conn., has purchased additional ground and expects to erect a new building, 40x200 ft.

The United States Steel Mat Co., New York, has purchased the Doebler plant at South Farms, Conn., and will equip it with new machinery for the manufacture of mats.

The New England Pin Co., Winsted, Conn., will erect a five-story brick building, 35x85 ft.

It is announced that the largest general shops of the Wabash system are to be built at Decatur, Ill. The Commercial Club of that city has this assurance from President Joseph Ramsey. For the erection of the buildings seventy-one acres have been deeded to the railroad company, and about $200,000 in cash has been raised by citizens.

Work has been commenced for the improvements to be made to the plant of the Frost Mfg. Co., Galesburg, Ill. As many men as can be used will constantly be kept at work, and it is hoped to have the construction work completed in sixty days. Three new buildings will be erected and considerable new machinery installed. When the additions to the plant are completed, the company will employ about 150 more men, bringing the total up to about 425. The new buildings will be a flange shop, 111x67 ft., a store house, 200x60 ft., an addition to the boiler shop, 165x105 ft., in connection with which will be a second riveting tower, 40x40 ft., 65 ft. high.

The recent fire at the plant of the Lakeside Malleable Castings Co., Racine, Wis., destroyed the foundry and core room completely, but left the other buildings untouched. A new foundry and core room will be built and will be about 25 per cent larger than the old buildings.

The Joy Stove Works, of Chicago, will construct a new plant at a cost of about $25,000.

Plans have been completed for a new plant, including a foundry, for the Aldine Grate & Mantel Co., at Grand Rapids, Mich. It expects to build the plant in the near future and to have it in operation by August.

The I Droege Foundry Co., of Covington, Ky., expects to replace its plant, which was recently destroyed by fire, with a steel structure. Temporary quarters for carrying on the work will be erected in the meantime.

A. A. Guilbert is making plans for a new foundry for the Lakeside Malleable Casting Co., of Racine, Wis., to take the place of the buildings recently destroyed by fire. The buildings are to be constructed of steel and concrete.

The stockholders of the Tacony Iron Co., of Tacony, Pa., will meet in Philadelphia, on April 27th to vote on an increase in the capital stock of the company from $50,000 to $200,000, the funds thus provided to be used in increasing the capacity of the plant, which is located at Tacony, Pa., and consists of an iron foundry, brass foundry, machine shop, etc.

The W. E. Pratt Mfg. Co., of Chicago, Ill., is adding to its foundry plant at Joliet, Ill., two buildings, one 80x200 ft. and the other 125x250 ft.

The Butler Foundry & Iron Co., of Chicago, Ill., has taken out a building permit for a one-story addition to its plant, to cost $8,000.

The Central Foundry Co., of Vincennes, Ind., is planning to build an addition to its plant which will give it from 15 to 20 more molding floors.

The Reading Iron Co., Reading, Pa., which recently purchased the plant of the Danville Rolling Mill Co., Danville, Pa., has decided to build an additional puddle mill at Reading, adjoining its Keystone blast furnace. The new mill will contain 20 puddling furnaces, which, with the newly acquired property at Danville, will give the company an additional supply of nearly 40,000 tons of muck bar per year.

The budget of Chicago for 1905 provides for an expenditure of $1,830,000 for bridges.

The Baltimore & Ohio Railroad will erect a steel bridge 815 ft. long at a cost of about $80,000, to replace the timber trestle that crosses the Okaw River near Springfield, Ill.

The Hardie-Tynes Co., Birmingham, whose foundry was recently destroyed by fire, will rebuild, and new machinery will be installed to replace that destroyed and badly damaged. The loss is covered by insurance.

The Archer Fence Co., South Bend, Ind., is erecting a plant 64 x 128 ft., which will be finished about April 1.

The contract for the construction of the Bergen Hill section of the Pennsylvania Railroad tunnel system has been awarded to the John Shields Construction Co., 1 Madison Ave., New York City. The work is to be completed in less than two years. The contract amounts to about $2,250,000. There will be two tunnels, each 1¼ miles long.

Extensions which the Babcock & Wilcox Co. is making to its plant at Bayonne, N. J., include a 300-ft. addition to the wrought iron department, where seamless headers for marine boilers and similar parts are made.

The Goodell-Pratt Co., manufacturer of mechanics' tools, Greenfield, Mass., will erect a building 40 ft. square, three stories, for japanning and hardening purposes.

The Illinois Central Railroad Co. is preparing to repair the terminals at New Orleans recently destroyed by fire. It is not known what the machinery and iron and steel requirements will be, but they will be large. The fire destroyed some 325 freight cars, which will be rebuilt.

The Best Foundry Co., Cleveland, recently incorporated, will erect a foundry at Bedford, near that city. The main building will be 180 x 400 ft.; finishing department, 50 x 275 ft., and pattern storage building, 40 x 40 ft. Plans have been prepared by Kaltenbach & Griess, Cleveland.

General Industrial Notes:—

At a meeting of the stockholders of the Charles Creighton Foundry Co., of New York City, the following officers were elected: John H. Allen, president and treasurer; James H. Norris, vice president and secretary; Charles H. Thomas, manager.

The Boston & Albany Railroad has closed a contract with the Boston Bridge Works for 3,000 tons of structural steel to be used in the construction of a bridge across the Connecticut river at Springfield, Mass. This is the largest contract placed in New England since the 9,000-ton contract for structural steel for the Boston Elevated, which contract went to the Fort Pitt Bridge Works.

Dodge Manufacturing Co., Toronto, Can., manufacturer of power transmission machinery, has secured a large order for machinery from the Grand Trunk Railway system for the new million-bushel grain elevator at Windmill Point.

Receivers of the New Birdsall Co., Auburn, N. Y., have

been authorized to reopen the plant for the purpose of manufacturing machinery. A number of orders for engines and threshers have been received since the concern became embarrassed. Most of the orders are from Europe. The order of the court permits the concern to borrow money with which to carry on the manufacturing.

The American Castings & Register Co., Akron, O., recently incorporated, has taken over the business of the American Castings Co., and will enlarge the plant. A general line of foundry business, in addition to the manufacture of hot air registers, will be carried on.

The Pullman Co. is working its shops in Pullman, Ill., full force, and is said to have orders to keep the plant busy up to next fall.

Twelve locomotives were shipped a few days ago from the Schenectady plant of the American Locomotive Co., consigned to Mitsui & Co., Tokio. They were shipped in parts, and will be assembled by Japanese workmen.

The Boynton Scale & Pump Co., of Toledo, Ia., will probably remove its plant to Des Moines, Ia. The company manufactures scales, portable blacksmith forges, iron water pumps, anvils, vises and harrow carts.

The fire at the plant of the Flint-Lomax Electric & Mfg. Co., Denver, Col., which occurred recently, did small damage. Repairs have been made and the foundry is running as usual.

The Davidson-Namack Foundry Co., Ballston Spa., N. Y., recently incorporated, has bought out the business of Uline Bros., of that city. The plant, while not large, is in good shape as far as convenience is concerned. The foundry is a modern one, and work can be handled up to six tons. The new owners have been repairing the machine shop and have added a jig saw and buzz planer to the pattern shop. Other machinery and equipment will be installed as the business warrants. The company has land enough to enlarge, which it hopes to do within a year.

The Sweet & Doyle Valve Co., Cohoes, N. Y., has been incorporated with a capital of $75,000. The incorporators are: H. M. Sweet, E. C. Doyle and J. H. MacLean, all of Cohoes The company is equipping a new plant at Troy, N. Y., for the manufacture of the Sweet & Doyle gate and globe valves in both brass and iron body. Machinery of the latest device for this line of business is being installed, and the firm hopes to have the plant running by April 1.

C. H. Urick, of Erie, Pa., is at the head of the project for starting a new jobbing foundry in Erie. His three sons will engage in the business with him. They expect to spend about $25,000 in equipping a new plant and will have it in operation in about two months.

The National Elevator & Machine Works, of Honesdale, Pa., have been sold to H. F. Guerney, New York City.

At the annual meeting of the stockholders of the Portsmouth Stove & Range Co., Portsmouth, O., the following officers were elected for the ensuing year: President, F. V. Knauss; F. M. Knauss, vice president, and Robert G. Bryan, secretary and treasurer.

Every open-hearth furnace in the Homestead plant of the Carnegie Steel Co., Pittsburg, was in operation last week for the first time in several years. From one to ten of the furnaces are generally off for repairs.

The 48-inch universal plate mill of the Carnegie Steel Co., South Sharon, Pa., was placed in operation last week for the first time in 18 months.

The Hill Tool Co. and the Standard Mfg. Co., of Anderson, Ind., has reorganized as the Hill-Standard Mfg. Co. Hugh Hill heads the directory. Capital stock, $20,000.

John McKinney of Bremen, Ind., has gone to Woodburn, Ore., where he will operate a foundry and machine shop.

John Touhill, proprietor of the Riverside Foundry & Machine Co., Pittston, Pa., has purchased the property at South Scranton, Pa., formerly occupied by the Lackawanna Iron & Steel Co. The property includes six acres and several brick buildings. Mr. Touhill will take his seven sons into partnership, and a company will be incorporated to be known as the Touhill Iron Works. As soon as possible, work will be started on getting the buildings in proper condition for operation as a foundry.

A new plant for the manufacture of safes, recently erected by the Wehrle Co. at Newark, O., is now in operation. Work on the latest foundry building of this company is in progress and will be finished within 30 days.

The contract for the ornamental iron work for the new court house at DesMoines Ia., has been awarded to the Twin City Iron & Wire Works, of St. Paul, Minn. The contract price was $24,980.

The Kerr-Murray Foundry & Machine Co., Fort Wayne, Ind., has received a large number of orders recently, necessitating the putting into effect of a ten-hour schedule.

The Uneedme Tool Co., Columbus, O., recently incorporated, will manufacture and sell tools for the removal of automobile tires and other tools needed in automobile practice. The company does not intend to erect a plant, but to have the tools made by other parties in Columbus.

The Parke-Pillatt Co., 21 Quincy street, Chicago, recently incorporated, will manufacture the Parke-Pillatt furnace. The company does not expect to build.

The Poler Mfg. Co., 21 East Saratoga street, Baltimore, recently incorporated, will build a machine invented by John W. Poler, the president of the company. The machine will make three folds of any ordinary letter, insert it in an envelope and seal the envelope. It is run by means of a treadle and is fed by hand, thus allowing two or more circular letters to be inserted in the same envelope, folded together. The company states that the capacity of the machine is limited only by the dexterity of the operator, and that 2,000 per hour is about the average so far, although the machine has not been in use long enough to have any one become an expert. The company will build ten of these machines, put them in different parts of the country and test them for six months to find out what improvements can be made upon them. It will then go into the business to the entire extent of its capital, $10,000. The first lot of machines will be built under contract, but later the company expects to have its own plant. The company has a number of other machines under construction, one of which will, from an endless roll of paper, print a circular, dry and fold it, put it in an envelope, seal the envelope and address and stamp it. The capital of the company has all been subscribed and there is none for sale.

The Hickox-Mull Mfg. Co., Toledo, O., formerly acting under a Michigan charter, has been incorporated under the laws of Ohio. The business will not be affected in any particular.

A contract for about 2,500 tons of water pipe for the Guanabacoa water works project, for which bids were opened at Havana recently, is being held up on account of the failure of the lowest bidder to observe the regulations regarding the registration at Havana of the concern supplying material. The lowest bidder was the Snare & Triest Co., New York. Iron pipe manufacturers in the South and West who have quoted prices on the proposition are much interested in the outcome.

Means, Fulton & Co., who recently purchased the plant of the Portsmouth Foundry & Machine Works, Portsmouth, O., will dismantle it and remove the machinery to Birmingham, Alabama.

The plant of the Indiana Bridge Co. at Muncie will soon be in operation in all departments. The removal of the plant to its new location in the southeastern part of the city will probably be effected during the summer and fall, but the moving will be done slowly, so as not seriously to interfere with its operation. The erection of the new buildings will be started as soon as the weather permits.